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The Mining Journal

LONDON, DECEMBER 16, 1960

Vol. 255. No. 6539. Price Ninepence

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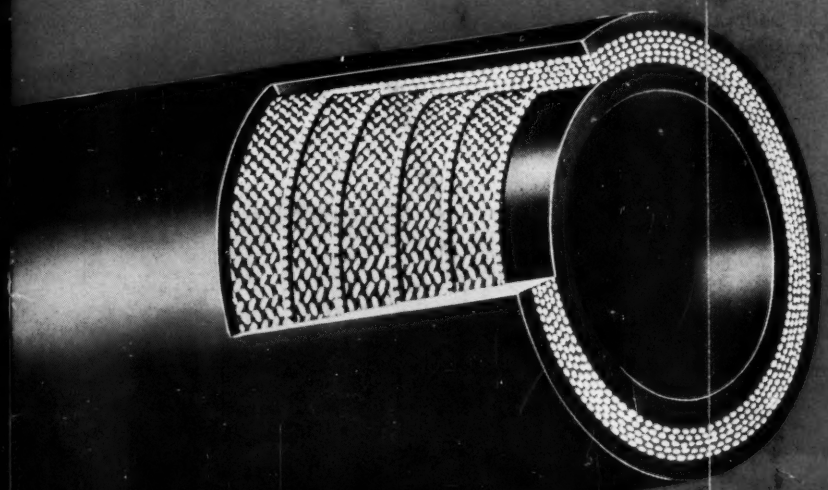

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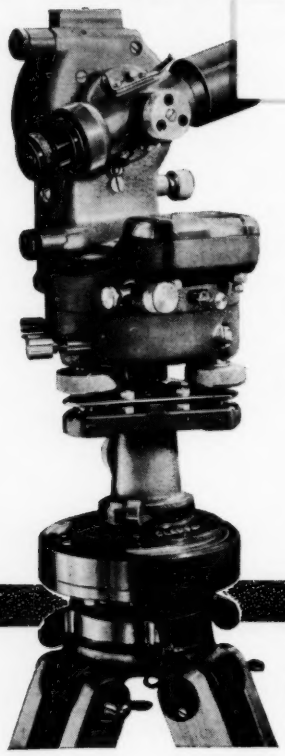

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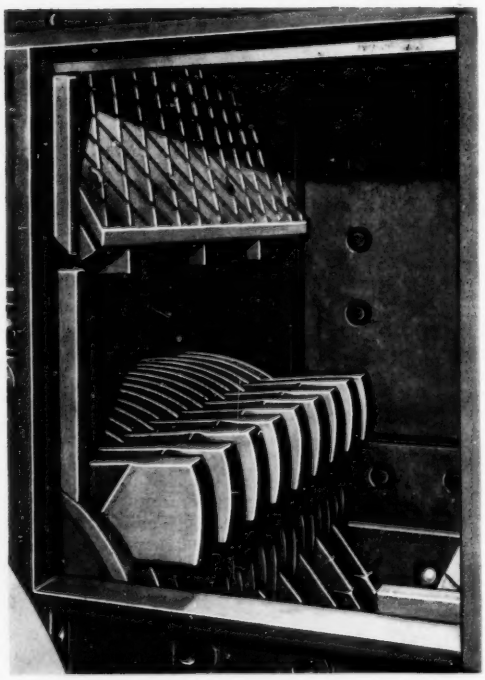

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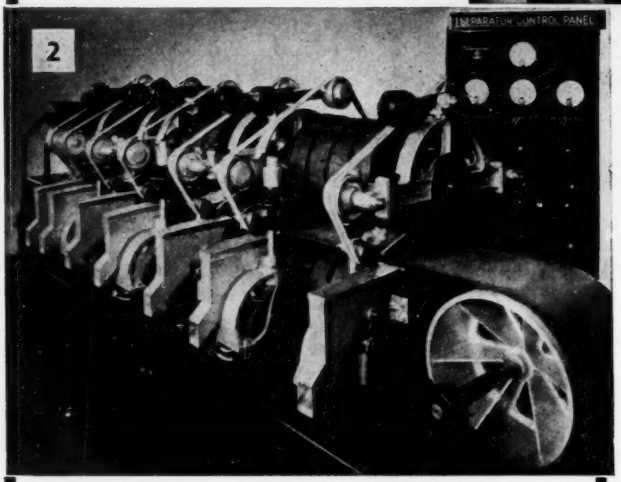

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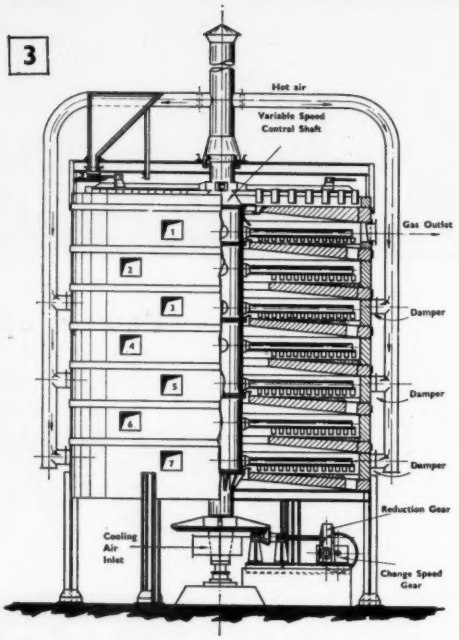

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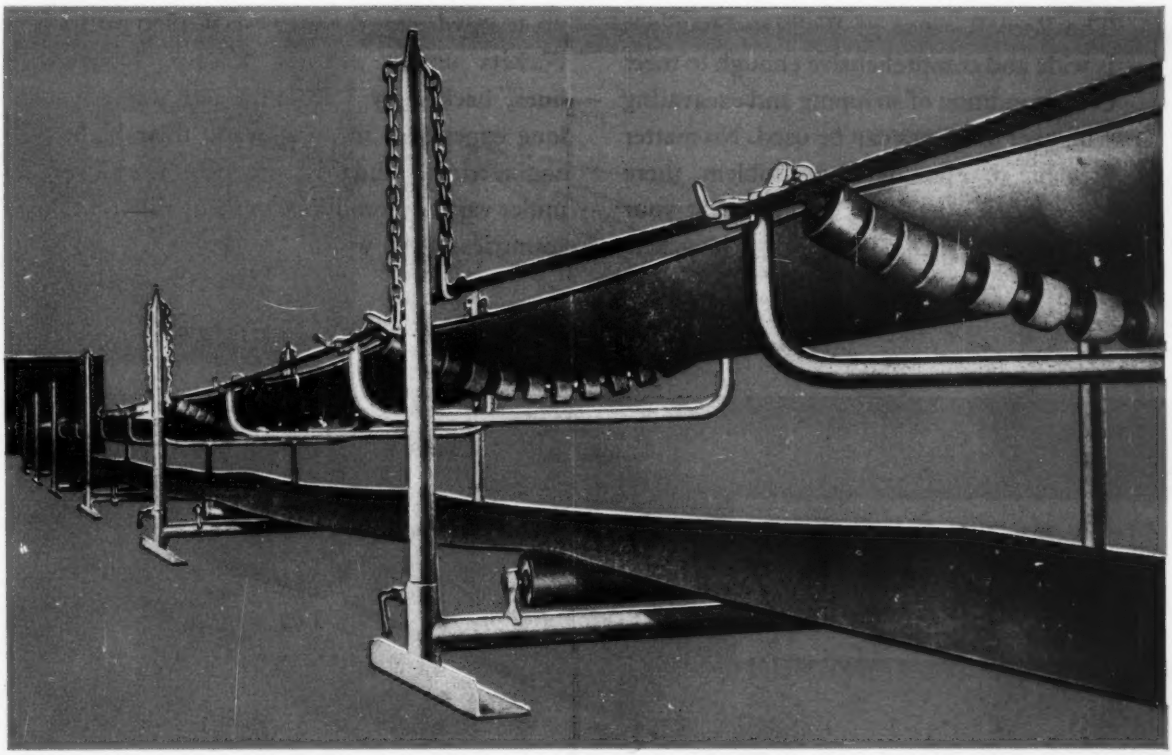

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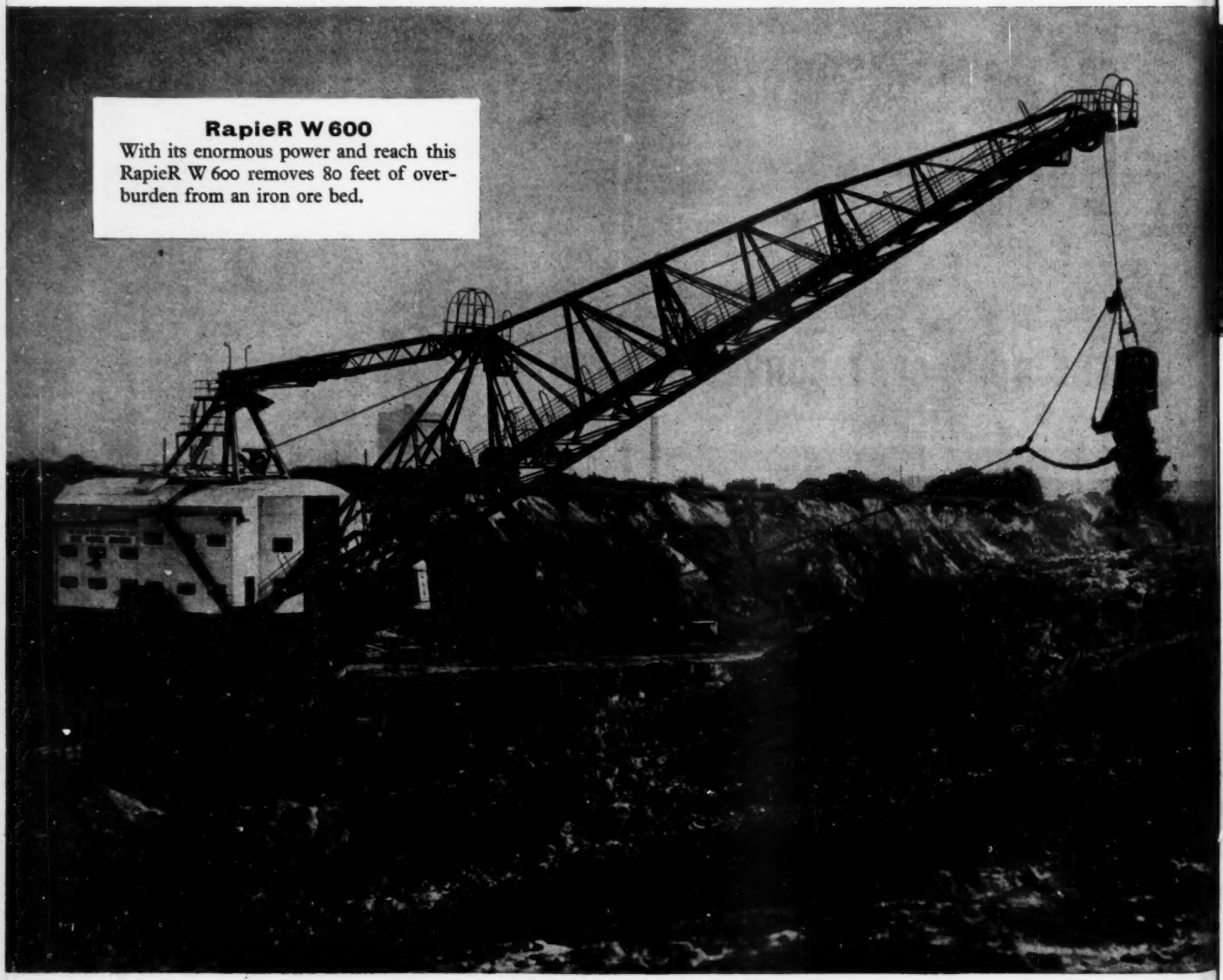

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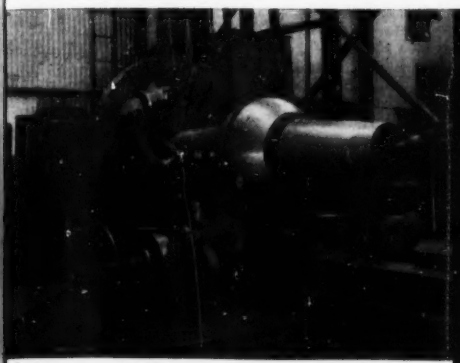
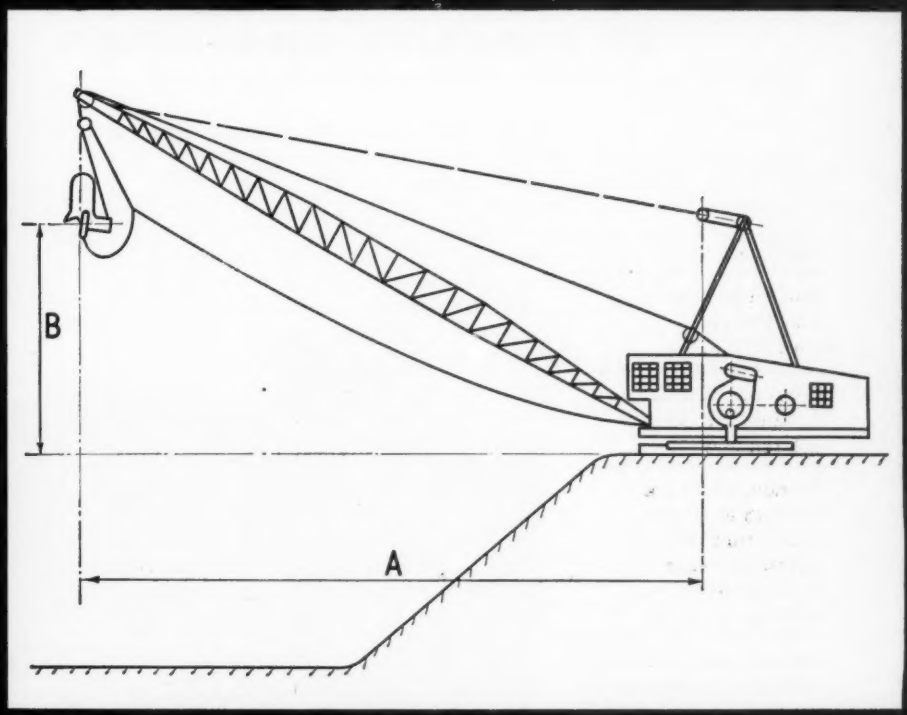


Parts of the W 1400 being made at Ipswich



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W 150	149′ 0″	3 to 3½	148′ 0″	46′ 0″	193
	132′ 0″	4 to 5	132′ 0″	35′ 0″	189
	121′ 0″	5 to 6	118′ 0″	38′ 0″	186
	121′ 0″	6 to 7	105′ 0″	57′ 6″	184
W 300	180′ 0″	5 to 6	178′ 0″	70′ 0″	375
	140′ 0″	7 to 8½	142′ 0″	52′ 0″	375
W 600	204′ 9″	8 to 10	201′ 0″	72′ 0″	792
	186′ 0″	10 to 12	184′ 0″	65′ 0″	777
	165′ 0″	12 to 15	165′ 0″	55′ 0″	776

TYPE	LENGTH OF BOOM	BUCKET CAPACITY CU. YD.	DUMPING RADIUS A	DUMPING HEIGHT B	WEIGHT IN TONS
W 900	247′ 0″	16	230′ 0″	100′ 0″	950
	229′ 6″	18	215′ 0″	90′ 0″	
	195′ 0″	23	185′ 0″	76′ 0″	
W 1350	271′ 0″	20 to 24	250′ 0″	112′ 0″	1375
	248′ 0″	29	230′ 0″	100′ 0″	
	230′ 0″	33	215′ 0″	90′ 0″	
W 1400	282′ 0″	20 to 24	260′ 0″	140′ 0″	1650
W 1800	303′ 0″	20 to 24	280′ 0″	150′ 0″	1850
	282′ 0″	30	260′ 0″	120′ 0″	
	247′ 0″	40	230′ 0″	100′ 0″	

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The Mining Journal

London, December 16, 1960

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Vol. 255 **No. 6539**

Established 1835

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Published each Friday by
THE MINING JOURNAL LTD.
Directors
E. Baliol Scott (*Chairman*) U. Baliol Scott (*Managing*)
G. A. Baliol Scott R. A. Ellefsen

15 WILSON STREET, LONDON, E.C.2

Telegraphic Tutwork London
Telephone MONarch 2567 (3 lines)

Annual Subscription £3 10s. Single copy ninepence

Trends in America's Iron Ore Trade

THE steel industry in the United States is at present operating at less than half capacity and it now looks as though we may be well into 1961 before any significant recovery takes place. The failure of steel production to match earlier expectations has led to a temporary reversal of the upward trend in U.S. iron ore imports, while the difficulties of domestic suppliers are indicated by the announcement last week that a leading iron ore company plans a severe curtailment of operations. American steel producers remain confident, however, that, despite increased competition from other materials in steel's traditional markets, the industry can look forward to steady expansion in the years ahead. A very large increase in the nation's iron ore requirements is foreseen, but supplies from foreign and domestic sources should be adequate for future needs.

Addressing a regional technical meeting of the American Iron and Steel Institute, Mr. Robert M. Lloyd, administrative vice-president (international and raw materials), for the United States Steel Corporation, said so much iron ore was available in so many different places in the world, that a highly competitive market in the international iron ore trade seemed assured for the next thirty years. In support of his statement that world reserves of "iron-in-ore" totalled at least 68,000,000,000 tons, or enough to meet projected demands for 200 years, he cited a recent report by Arthur D. Little, Inc. and United Nations' studies.

Mr. Lloyd also emphasized the increasing importance of foreign ore in the U.S. domestic steel industry, in which context he quoted American Iron Ore Association statistics showing that receipts of iron ore from foreign countries (except Canada) in the first nine months of 1960 totalled nearly 19,300,000 gross tons, as compared with 14,600,000 tons in the corresponding period of 1959. Receipts of Canadian ore also increased, those from Lake Superior rising about 50 per cent to over 2,900,000 tons, while those from other parts of the Dominion (mainly Quebec) rose by about 600,000 tons to 6,500,000 tons. Venezuela accounted for more than half this year's imports from non-Canadian sources and other leading suppliers were Chile, Peru and Brazil. Substantial quantities also came from five other countries in various parts of the world, and small quantities from numerous countries.

Another of the points stressed in this address was iron ore's traditional freedom of movement in international markets without the imposition of tariffs or quotas. In this connection it was pointed out that the effect of tariff protection for the U.S. domestic ore industry would be to raise steel prices, which would lead to lower steel exports and increased imports of foreign steel. Noting that the cost of transportation was a major factor in the cost of imported ore to the consumer, Mr. Lloyd predicted that in the years to come the trade would tend to become concentrated in large operations capable of supporting the capital investments required for low-cost transportation.

It was further noted that the growing use of imported ore in the United States had been tied to the construction of new steel plants to service market areas more remote from domestic ore sources, but easily accessible to imported ores, " plus the furnace benefits realizable at some plants from the generally higher quality foreign ores ".

The highly competitive situation in the American iron ore industry was also underlined in a paper recently delivered before the American Mining Congress by Mr. C. F. Beukema, president of U.S. Steel's Oliver Iron Mining Division, who outlined the industry's problems in producing iron ores of acceptable quality in competition with producers of iron ore throughout the world. Nowhere in the iron ore industry today, said Mr. Beukema, was any supplier assured of a market free from competition that might arise at any moment from an ore with a better price-quality ratio. Such world-wide competition, he stated, resulted in an iron ore industry operating on an international basis that produces iron ore metallics of the highest quality at the lowest possible price to meet the demands of ore buyers both in the United States and elsewhere.

U.S. domestic iron ore producers are following with interest the Tariff Commission's inquiry into the alleged injury to the domestic iron ore industry from imports. Mr. Beukema expressed the view that the enquiry would disclose that Minnesota's methods for taxing iron ore had had a direct impact on the national economy, since steel prices had been forced to carry the excessive Minnesota tax costs passed on in higher iron ore prices. The enquiry is also expected to reveal that Minnesota taconite technology is well advanced, but that investors have not yet been offered definite assurances that the Minnesota state and local tax burdens of the past will not be shifted increasingly to the taconite investments as the natural ore source is depleted. The tax climate was described as a matter of paramount concern to iron ore producers operating in Minnesota.

So far as the Canadian iron ore industry is concerned, the major problem, not only in the short term but for some years to come, will be that of finding markets. This is the conclusion reached in a study prepared by the Bank of Nova Scotia. Notwithstanding the rise in shipments, the prolonged strike in the United States did not lead to the expected greater demand for Canadian ore in the early months of the year. There was no shortage of ore when the U.S. mills started operations again in November, since the mills went into the strike with large stocks, and through the remainder of the year imported sufficient ore to bring the year end reserves to almost the same level as 12 months previously. Since then steel demand has fallen more rapidly than was anticipated from the very high post-strike levels achieved in the first quarter, and it has been unnecessary to accelerate shipments of ore to mills. As a result, Steep Rock Iron Mines has had one of its worst seasons since it started selling ore some 15 years ago and other Canadian producers have also been affected.

Despite this setback, exploration for and development of, new Canadian iron ore projects continues apace, states the bank. In 1964, when these developments are completed, Canadian annual capacity for production of iron ore concentrate will have been increased by about 20,000,000 tons. Projects now under exploration will support a further large expansion of capacity in later years, if necessary.

In this connection it may be recalled that a United Nations study discussed in one of our recent issues *(The Mining Journal,* Nov. 4, 1960) predicted that in 1975 world steel consumption would amount to some 625,000,000 tonnes as compared with some 300,000,000 tonnes last year. On present indications, however, the development of iron ore resources can be expected to keep fully abreast of the steel industry's rising needs. It would also appear that to no small extent the future pattern of supply will be governed by technological progress in the treatment and utilization of lower grade but more accessible ores. This suggests that it is in liberal tax laws designed to stimulate risk capital in the development of the poorer grade ores, rather than in any measures to discourage the development of foreign sources of supply, that the interests of U.S. domestic ore producers, as well as those of the steel industry itself, can best be served.

GOING ROUND IN CIRCLES

Sir Joseph Ball in his address to shareholders at last week's meeting of Lake View and Star has brought to our notice yet again the exceptional burden placed upon mining in Australia by that country's industrial wage structure. This is, of course, an affliction suffered by all types of Australian mining, and indeed by industry generally, but its impact on gold mining, which for the past eleven years has been receiving a more or less fixed price for its product, has been especially severe.

As Sir Joseph points out, a wage structure, which is founded on a basic wage linked to the cost of living and subject to quarterly review by arbitration courts, provides the best possible assurance that the process of spiralling wages and costs will continue indefinitely. Thus between February, 1949, and October, 1960, the basic wage at Lake View increased from £A6 12s. 9d. to £A14 7s. 1d. per week.

Some idea of what this means in terms of total costs can be gauged from the fact that a shilling a week increase in basic wages at Lake View represents an annual increase in labour cost of about £A2,000. In addition, there were increases in 1955 in extra rates paid to skilled and semi-skilled operators representing a cost increase of £A25,000 per annum and a further similar increase in May of this year which will cost the company £A34,000 in a full year, equivalent to nearly 1/- per ton milled.

Moreover, this reflects only the impact of direct wages and the gold industry is affected no less by the sharp rise in the labour cost element in all its purchases of consumable stores as well as in purchases on capital account which have been particularly heavy in recent years.

It is no small tribute to Lake View's management that in these circumstances working costs per ton have over the past four years risen by only 1/- a ton while the grade, both of the mill throughput and of payable ore reserves, has remained virtually unchanged. However, this has been made possible only as result of capital expenditure (notably on improved hoisting facilities) which over the last four years alone have about equalled the company's entire issued share capital.

Moreover, not only is this a way out, which is obviously denied to many of Australia's more marginal producers, but even where the capital is available, there are limits to the scope for raising mining efficiencies. Consequently Sir Joseph Ball has sounded a warning to his shareholders, which will doubtless find an echo throughout the gold industry, that in the absence of a change in Australia's wages policy or of some revision of the Gold Mining Industry Assistance Act 1954 (or, of course, of a rise in the gold price), Lake View must now anticipate a period of declining profits and consequently of dividends.

It may well be that the most promising solution to this long-term problem could be through a revision of the method of assessing the gold bounty, which at present applies only to a limited number of marginal producers who qualify for a subsidy at varying rates up to a maximum of £2 15s. an oz. By Australian standards, Lake View's present

profit level of 13/6d. (Aust.) per ton puts it outside the category of marginal producers, although it is perhaps significant that Gold Mines of Kalgoorlie shows in its latest accounts of profit per ton of 13/1d. (Aust.) of which nearly 8/- per ton came from the subsidy. Nevertheless, if costs at Lake View were now to rise sharply, the elimination of marginal ore from the reserves might in a few years become so considerable as to limit the scale of mining to the point where full milling capacity could no longer be sustained. Once this point were reached the burden on costs would be further sharply increased.

In such circumstances the Commonwealth Government, which has an obvious and admitted interest in maximizing the country's gold production, might do well to consider applying the principle of subsidy to all marginal reserves, irrespective of the overall profitability of the mine.

Such a proposal no doubt invites the reply that Australian gold mines (and resident shareholders) already enjoy total tax exemption on income from the production of gold, but there has to be a profit before this admittedly handsome concession has any value. Lake View itself is, of course, still a long way from being in the red and it might in any case not be to its advantage to apply for assistance to work its submarginal reserves so long as full milling rate can be maintained from ore above the pay limit.

The Commonwealth Government's primary objective, however, is to keep existing producers operating profitably at the lowest practicable pay limit, and consequently for as long as possible. This is not merely a question of maximizing gold production in the national interest; there is also the strictly local problem of the future of the two quite sizable townships which have grown up on the Golden Mile and which, being solely dependent on gold mining, would become a distressed area, with all its attendant political and economic problems, if the industry were to disappear prematurely.

The cost of deferring the onset of sharply rising costs to a mine like Lake View, which at present cost levels can still look forward to a longish life, would not seem to be large. During 1951 and 1952, years of exceptionally rapid rise in costs, an increase of some 10/- per ton resulted in the elimination of 450,000 tons of low grade ore from the reserves. Assuming total developed reserves were equivalent to about five years' milling, and that on average a subsidy of 5s. per ton would have been sufficient to restore the eliminated reserves to payability, the annual subsidy would probably have been of the order of £30,000 a year. Moreover, there are, of course, no grounds for assuming that costs are going to rise at anything like the 1951-52 rate in the near future.

Lake View, like other U.K. domiciled mining companies, is of course also in the additionally disadvantageous position of having to pay full U.K. tax on all dividends paid to British shareholders. This means that the building up of capital reserves against, for example, the eventual necessity of developing the mine at greater depth may only prove possible at the cost of cutting the effective net dividend rate. At the same time the Australian Government is making substantial tax concessions, out of which it might legitimately expect such capital provisions to be made, only to find that the British Government is appropriating a large part of a profit which has only been made possible in the first place by Australia's more enlightened tax policies.

If the British Government persists in this attitude, it can hardly expect mining groups with predominantly British domiciled shareholders, to continue to be granted mineral rights in Australia (or indeed elsewhere) in competition with groups financed by shareholders from countries whose tax laws do not nullify the effect of incentives designed to offset mining's special risks and depreciations.

PROTECTION AGAINST POLITICAL RISKS

On several occasions during the past two years we have referred to the need for some system of guarantees or indemnities for the protection of investors against the non-commercial risks associated with countries which are politically immature or which are bordered by other nations where unstable conditions exist. The subject was fully discussed in our issue of October 21, 1960, pp. 339 and 440, in which emphasis was laid on the possibility of relieving the taxpayer's burden by stimulating the flow of private capital to the underdeveloped countries.

Latterly there have been growing indications that the emergent territories themselves would welcome a practical scheme of insurance against political risks, capable of removing the main, and perhaps in many cases the only, obstacle to the private capital which their governments are prepared to welcome with open arms.

This problem was discussed at considerable length at a 3-day International Businessmen's Conference in Karachi, attended by about 500 delegates from 32 countries. As Mr. J. L. Steel, head of the British delegation, emphasised at the conference, hunger for investment capital is a major problem and government loans can meet only a fraction of the need. From the point of view of developing countries, the contribution made by private foreign investors is of immense importance.

Mr. Mohammad Ali Rangoonwala, Pakistani chairman of the Commission for Asian and Far Eastern Affairs and of the Conference, declared that aid-giving countries had been holding back capital because of insecurity of investments through lack of safeguards. He therefore proposed the establishment of an international investment trust of developed and developing countries, which should function as an insurance corporation, providing guarantees to foreign investors for security of their funds.

Sir Jeremy Raisman, deputy-chairman of Lloyds Bank, invited countries seeking foreign investment to formulate a fair-treatment code, which would encourage the flow of international capital into their territories. He recalled that the International Chamber of Commerce had suggested on several occasions in recent years that there was a need for such a code, to which developing countries would be willing to subscribe.

On the last day of the conference the delegates declared their " great concern at arbitrary and discriminatory acts of expropriation ", which harmed the interests of developing countries and investors. They urged that nationalization, " if applied at all, should be non-discriminatory and accompanied by effective and adequate compensation ".

Finally, the conference recommended that the International Chamber of Commerce study proposals made for the provision of guarantees and insurance facilities to cover non-commercial risks, " particularly in the international context." In this connection the statement referred to discussions for a plan for an international investment guarantee institution " with a membership roughtly the same as that of the World Bank ".

As previously reported in *The Mining Journal*, an internationally recognized charter laying down safeguards for foreign private capital was drawn up by Sir Hartley Shawcross, former British Attorney-General, with a group of British lawyers, for examination by O.E.E.C. experts. Plans for a European-African conference to prepare an investment statute and a special fund providing guarantees against the risk of nationalization, local disturbances and civil wars, were submitted by the Council of Europe's Ministerial Committee to the Foreign Ministers' deputies of member countries. The United States authorities have also been seeking a solution to the problem.

Records Galore in

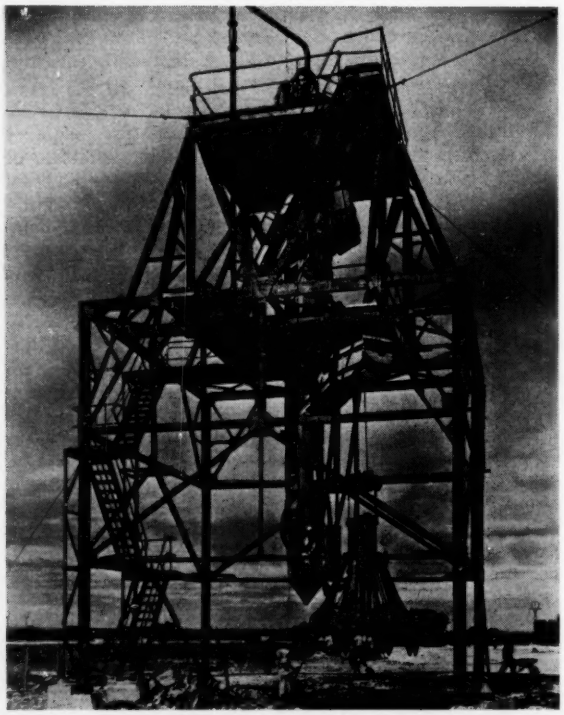
IMPROVED equipment and techniques coupled to human effort of the highest order have together advanced yet again the upper limit of achievement in high speed shaft sinking. A new world record of 1,106 ft. of shaft sunk and lined in 31 days is recently announced at the No. 4 Shaft of the Hartebeestfontein Gold Mining Co. Ltd. in the Klerksdorp district of the Transvaal. With a target figure of 3,000 ft. over a 3 monthly period to the end of this year, the aim is to achieve a consistently high rate of advance, and with a world record chalked up incidentally for the first month of the three the target may well be exceeded.

Sited some 8,000 ft. to the south-west of No. 2 shaft, the new No. 4 shaft will provide additional hoisting facilities for opening up the deeper area of the property and exploiting the more recently acquired Mapaiskraal ground. It has a lined diameter of 24 ft., a planned final depth of around 7,500 ft. and should intersect the Vaal reef horizon at about 6,500 ft.

Highest Cleaning Capacity

In all high speed development work cleaning facilities are necessarily designed for reliable capacity at a high level—in this case the highest yet. A re-designed, pneumatically-operated cactus grab of 30 cu. ft. capacity is used in conjunction with 14-ton kibbles and the two permanent 5,145 h.p. hoists, converted to single drum operation, working off the bottom. A 2,300 h.p. service hoist is used down to the top deck of the stage.

The Harties lashing gear designed by Anglovaal and fabricated by Wright Anderson. Pneumatically operated, it can clear 300 t.p.h.



This combination of equipment to date has achieved an average cleaning rate of 280 tons per hour, with a best performance of 322 tons per hour.

A novel feature has been the use of closed-circuit television, with a camera at the point of discharge of the kibbles and screens at the hoist control desk and in the pressurized banksman's cabin. Complete discharge of rock from the kibbles is ensured by this means. A second camera installed on the stage gave a satisfactory picture of work on the bottom until it succumbed to the arduous conditions.

For the winding of machines, drill steel and other equipment a sling bucket is used suspended from the bottom of the kibbles which, on account of their large size, would otherwise present loading and unloading difficulties. Aside from this primary function, the slings have proved valuable time-savers and may well become accepted as standard sinking equipment.

"Birdcaging" of the 2⅛ in. dia. hoisting ropes at the kibble attachment has been prevented by use of a new design of rope capel.

Cover Drilling Eliminated

Of recent years, the pre-cementation of shaft sites, prior to collaring, by means of boreholes put down from surface through the water-bearing dolomites has become accepted in the O.F.S. as standard practice. This technique has greatly reduced time lost in sinking operations due to grouting from the shaft bottom, although some water-bearing fissures have been encountered in pre-cemented ground.

With a view to improving the effectiveness of the pre-cementation cover at the Hartebeestfontein No. 4 Shaft, extensive pre-grouting was carried out from the bottom of the shaft collar, some 160 ft. below surface, to below the dolomites at a depth of some 1,700 ft. This ensured positive sealing of all fissures in the immediate vicinity of the shaft, and since the holes were collared below the level of the natural water-table, any water intersected made its presence abundantly clear by issuing forth under a small head. Cement, with slag and slime fillers, was injected as required.

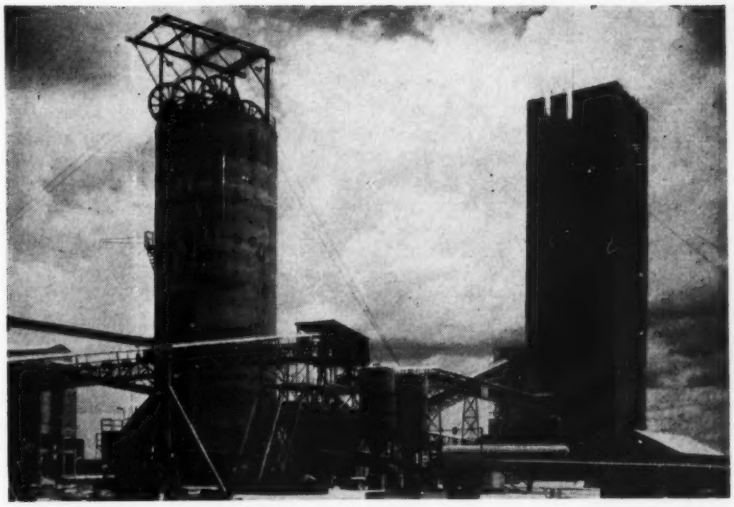
Drilling was carried out by eight Seco 99, 14 h.p. diamond drills working below a protective penthouse while equipping of the headgear proceeded above. To date no further grouting has been required.

Improved Safety

A change to 1¼ in. steel in place of the traditional 1 in. has been made partly to reduce the incidence of injury resulting from steel breakage with the heavy, 130 lb., Seco type S 27 machines. A smaller number of larger holes is drilled and specially manufactured 1½ in. by 22 in. 74 per cent explosive used in place of the 1 in. by 8 in. 64 per cent common in shaft sinking in the past. Fragmentation so far has been good with 104 holes per round drilled to depths up to 10 ft. 6 in.

It is interesting to note a return to rubber-collared rods, slippage of the collars being prevented (presumably) by surface patterning of the rods.

South African Shafts

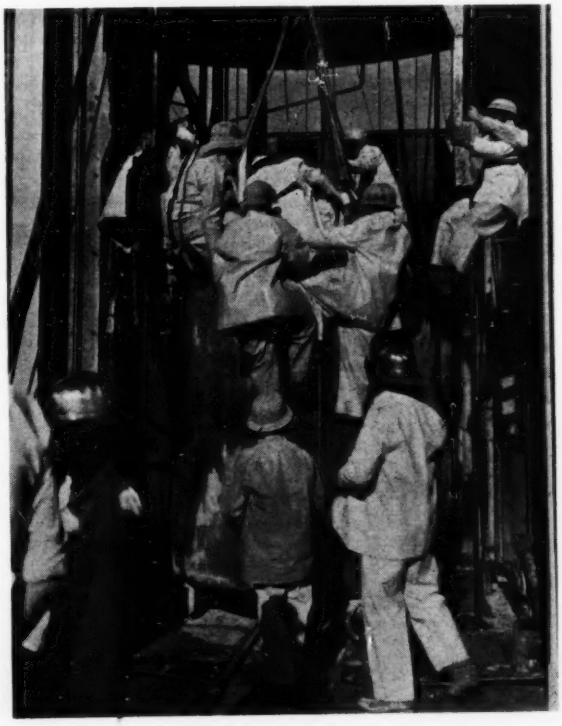


No. 2 shaft, Vaal Reefs

World Record Footages in Shaft Sinking 1957 to date

Location	*Date*	*Footage*	*Size of Shaft* (lined dia.)
F. S. Saaiplaas No. 2 Shaft	Sept. 1957	834	27 ft. 6 in.
New Boutoff Don Colliery U.S.S.R.	April 1959	868	18 ft.
Vaal Reefs No. 2 Main Shaft	Sept. 1959	922	26 ft.
Ditto	Nov. 1959	954	26 ft.
President Steyn No. 3 Main Shaft	Nov. 1959	1001	24 ft.
President Steyn Ventilation Shaft	Jan. 1960	1020	22 ft.
Hartebeestfontein No. 4 Shaft	Oct. 1960	1106	24 ft.

Sinking crews at No. 4 shaft, Hartebeestfontein. The 14-ton kibbles were the largest ever used in shaft sinking



Over the past 4 years, no less than six world record footages in shaft sinking have been established in the mines of the Transvaal and Orange Free State, as shown.

Aside from pre-cementation, the remarkable increase of over 30 per cent shown in these figures cannot be attributed to new methods or techniques but rather to an all-round improvement in well-tried principles together with the development of improved cleaning equipment allied to increased hoisting capacity. Pre-cementation has more than proved its worth during this period and the new methods used at Hartebeestfontein are undoubtedly of the greatest importance.

History made at Vaal Reefs

Measured in terms of tonnage excavated, the figure of 57,150 tons broken and hoisted from the Vaal Reefs No. 2 Main shaft sinking operations in November last year is still without equal, and the speed and magnitude of the pre-production development in the No. 2 Shaft system as a whole is unique in mining history.

The new shaft system comprises a main shaft, 26 ft. in diameter, sunk to 7,052 ft. and a ventilation shaft some 200 feet distant sunk to 6,865 ft. These constitute the deepest single-lift shafts in the world.

Over a period of 16 months to October this year in the No. 2 Main and Ventilation shafts a total of 13,917 ft. of shaft sinking and 2,855 ft. of development had been completed, this representing an excavated tonnage in excess of 600,000. On the basis of the original estimates, a saving was made on sinking time of over 12 months, initial production being brought forward and fixed charges reduced accordingly.

Impressive though the achievements at Hartebeestfontein and Vaal Reefs may appear today, records are made to be broken and it is unlikely that the figure of 1,106 ft. achieved in October will stand for long. Mr. Martin Tucker, shaft supervisor for the Hartebeestfontein and Zandpan mines thinks that, given a little luck and favourable rock conditions, a footage between 1,300 and 1,500 ft. in a month is possible using present equipment and techniques.

India's Mineral Industry

WRITING in the Independence Number of *The Eastern Metals Review*, R. K. Sinha, of the Indian Bureau of Mines, Nagpur, states that a significant turning point has been reached in the development of India's mineral industry. An all round attempt is being made to achieve maximum self-sufficiency in most requirements of minerals, metals and fuels. Particularly the iron, steel and aluminium industries have made great strides in achieving this objective. Similar attempts are being made in increasing copper, lead, zinc and silver output, developing new deposits of pyrites for sulphur, opening up new coal and iron ore mines. Likewise, efforts are also being made to establish machine building plants. A coal mining machinery plant at Durgapur, and a heavy machinery and a foundry forge plant at Hatia near Ranchi are under construction.

All these rapid developments call for radical changes in India's outlook. For various reasons it is suggested not to fit vital industries like iron and steel, aluminium, copper, lead and zinc, and sulphur within the framework of five-year plans, and it is stressed that these may be developed on a long-term basis, covering a minimum period of 15 years or so. A production target to be achieved within 15 years may be fixed and achievement targets, if felt necessary, may be phased over the successive plans. Similarly the proving and exploitation of mineral deposits should synchronise with requirements.

Iron and Steel

In the last few months, many arguments have been put forward for the fixation of the steel target in the Third Plan. It fluctuated around 10,000,000 tons and ultimately a target of 9,200,000 tons a year including 2 lakh tons likely to be produced by secondary producers was decided upon. The target of 9,000,000 tons would be achived by increasing the production capacities of Rourkela, Bhilai and Durgapur to 1,800,000 tons, 2,100,000 tons and 1,600,000 tons respectively, and by making a provision for a fourth plant at Bokaro which will have 1,000,000 tons a year capacity, though only half the production capacity is to be achieved by the end of the Third Plan. The remaining 3,000,000 tons is scheduled to come from TISCO, IISCO and Mysore Iron and Steel Works.

Fixing of the steel target at 9,000,000 tons has no bearing on the ground of self-sufficiency. India's *per capita* consumption is too low and as such any amount of steel that could be produced in the near future would still be insufficient. This can be realized from the fact that during 1959 there was a heavy inflow of steel in the United States when the steel strike there continued for only 118 days. A production of 30,000,000 tons to be achieved by 1975 would be a realistic target for India.

How can this target be achieved? Obviously it cannot be by inviting a score of foreign consultants to erect the plants. It has to be achieved within the limits of India's financial resources and technical know-how. One of the unhappy trends in the execution of the Five-Year Plans has been the tendency to think in terms of foreign exchange and collaboration. It is necessary now to reorientate thinking in this respect.

Licences for the setting up of nine small scale plants, each having on average 15,000 tons a year of pig iron production capacity have been granted, out of which two, one in Barbil, Orissa, and another in Coimbatore, Madras have gone into production. The remaining plants will be located in the States of Madras, Maharashtra, Madhya Pradesh and West Bengal.

The small scale plants, if properly planned and developed, can generate a great momentum in industrialization. These smaller units should be allowed to expand and modernize their plants every year. It may be noted that TISCO is a brilliant example today of such expansion and modernization. The same methods may be applied for setting up of smaller units and for their gradual expansion and modernization. Foreign collaboration or assistance may be sought when it becomes absolutely necessary. Bokaro should form a testing ground for Indian talents.

It has been pointed out that the development of the mineral industry requires clear thinking, especially when embarked upon on a big scale. The present steel plants have already begun to feel the difficulty of getting supplies of coal, limestone and dolomite of requisite quantity and quality. The National Metallurgical Laboratory has been successful in producing pig iron in a low shaft furnace utilizing non-coking coal. This will entirely change the complex of coal economy.

Before making any expansion in the capacity or erection of a new unit, blocking of new areas for exploitation or expansion of existing mines becomes inevitable. If a target of 30,000,000 tons of steel is to be achieved, the proving of adequate reserves must begin now. Thirty million tons of steel will require 150,000,000 tons of mineral and ores to be hauled up every year. A further provision of adequate reserves for a minimum period of 30 years will have to be made. This means nearly

A panoramic view of the main pumping test grid of the South Arcut lignite project at Neiveli

4,500,000,000 tons of raw materials in terms of iron ore, coal, limestone, dolomite, chromite, magnesite, manganese ore and silica of requisite quality will have to be blocked well in advance. This will entail training of large numbers of geologists in the field, which should be done.

Aluminium

The development of the aluminium industry has special significance in India because there is a shortage of other base metals such as copper, lead, zinc, tin, etc. The availability of bauxite deposits in abundance is a favourable factor which makes India an ideal place for development of an aluminium industry in Asia. A minimum of 1,25,000 tons a year capacity may be attained by 1975. This would mean the creation of 40,000 tons additional capacity every year within a period of 10 years begining from the end of the Third Plan. It is expected that by the end of the Third Plan, India will be producing about 83,000 tons of aluminium ingots for which licences have already been granted. It is further learnt that Gujarat and Mysore are also contemplating the setting up of aluminium plants in their respective states. Though Gujarat possesses high grade bauxite it has no hydro-electricity, and hence the establishment of an aluminium plant in the state appears doubtful, unless some new development regarding the supply of cheap electricity takes place. The favourable areas for setting up additional aluminium plants in the country are Ranchi in Bihar, Amarkantak area in M.P., and Riasi in Jammu and Kashmir. In Madhya Pradesh there are good deposits of bauxite in Sarguja, Raigarh, Bilaspur, Drug and Balaghat, but setting up of aluminium plants in these districts will again depend upon the availability of a main electricity supply.

Copper, Lead and Zinc

The position of copper output remains the same as it was a decade ago. Indian Copper Corporation's smelter at Maubhandar is the only unit in India producing copper. New copper fields have been located and proved in Rajasthan and Sikkim, and copper projects explored at Gani in Kurnool district, Andhra Pradesh. The major portion of the Singhbhum copper belt, extending over a length of 80 miles, remains to be explored. Two electrolytic copper plants of 10,000 tons and 8,500 tons capacities are proposed at Khetri in Rajasthan and Mosabani in Bihar. For the latter plant a licence has been granted to Indian Copper Corporation. By the time these schemes go through, the country's requirements will be touching a lakh tons a year. Considering the present trend in consumption it can reasonably be expected that consumption of copper will increase to over one lakh tons within a period of 15 years from now. To meet the demand at that level, India will have to multiply its production 15 times from the present level of output. It is at any rate an immeasurable task and it is difficult to conceive that the country will be able to meet its requirements internally.

The present rate of copper production is less that 8,000 tons a year as against estimated requirements of 60,000 tons.

During 1959 India's production of lead metal and zinc concentrates was about 4,000 tons and 10,000 tons (56 per cent zinc) as against the demand of 30,000 tons and 60.000 tons respectively. Zawar mine in Udaipur is the only area producing lead and zinc ores. The mine is worked by the Metal Corporation of India Ltd. This company has launched a scheme for raising output from this mine and for setting up a zinc smelter with an initial capacity of 15,000 tons a year to be doubled later on. There will be a corresponding increase in the production of lead and the recovery of silver, at present being refined at the company's factory at Tundoo. These schemes are likely to be completed by 1962.

Woman mica splitters at a mica mine in Andrha State

The trend in consumption of these two metals indicates that in spite of raising the production capacity of lead and zinc the country will not be able to meet even one-fifth of its requirements. There are two or three good deposits of lead and zinc in Jaipur and Ajmer districts (Rajasthan), Raisi in Kashmir, which require immediate attention. There is another approach to this problem, viz., setting up of smelters in the country based on imported lead and zinc concentrates.

Sulphur

The pyrite deposits of Amjor in Sahabad district, Bihar, currently being prospected by the Indian Bureau of Mines, have established 154,000,000 tons of sulphur equivalent of pyrites in an area of 38.69 sq. miles. This deposit alone will meet India's entire requirements of sulphur and sulphuric acid for many centuries. The Pyrites and Chemical Development Corporation has been set up to exploit and produce sulphur and sulphuric acid by the Orkala process.

Mineral Concession on Trade

On an average there are about 2,450 working mines (other than coal) in India of which mica, manganese ore, limestone, and iron ore mines constitute 90 per cent of the total. There are very few mines which are mechanized, worked systematically and winning appreciable amounts. Most of the mines are very small and their production capacity varies from a few tons to a thousand tons per year.

It is felt that mine owners should voluntarily combine to form bigger units and pool their resources for systematic development of mines by improved mechnized methods and earmark some funds for research and utilization.

Export and Import Statistics of Minerals and Metals

Value in (Rs. '000)

	Export from India		*Import into India*		
Year	*Mineral*	*Metal & alloys*	*Mineral*	*Metal & alloys*	*Net Balance*
1957	641,396	34,542	94,140	1,911,009	— 1,329,211
1958	460,129	29,328	79,920	1,328,324	— 918,789
1959	469,625	73,064	101,683	1,230,131	— 789,125

N.V. BILLITON MAATSCHAPPIJ 1860-1960

To mark its centenary, which falls this year, N.V. Billiton Maatschappij, the well-known Dutch mining concern, has published a commemorative volume, describing in Dutch (with an English summary) the activities of the company over this period. Originally concerned only with the recovery of tin in Indonesia, Billiton has, in recent years, widened the scope of its interests to include activities associated with its own production of raw materials

IN the largest section of the commemorative volume, that dealing with tin, it is revealed that there was no proof of the existence of tin on Billiton island until 1851, the native population having been successful in hoodwinking outsiders on this point until Baron Van Tuyll van Serooskerken, supported by a bank credit of a million guilders and accompanied by John F. Loudon and other experts, found good quality tin ore there in that year.

Following the granting of a 40-year concession, Loudon remained on Billiton to direct pioneer operations until 1855 but the enterprise languished until 1860 in which year its promoter Baron Van Tuyll van Serooskerken died and N.V. Billiton Maatschappij came into being at The Hague. The company mined tin in Indonesia up to 1958 and on the island of Singkep up to 1959.

At Billiton, the Chinese made up the major part of the labour force, which at the peak of the manual labour period, numbered, at times, as many as 20,000. For many years the "Kongsie-noempang" incentive system was operated there and later under increasing mechanization an attempt was made to retain the labourers' share of the proceeds by putting out much of the work, while advanced social services were also made available. At the same time, the Europeans who had previously acted as buyers of the "kongsie"-produced tin became the technical leaders of the business.

No great quantities of tin were produced during the Japanese occupation in World War II and the Dutch employees quickly returned in 1945.

Tin was mined on the Indonesian islands first to recover secondary (alluvial) ore and then for primary (lode) ore. Alluvial mining on the "kollong" system involved draining, creating earth and ore mud, elevating these and washing the ore. Initially carried out by hand, these processes successively made use of the machinery available until operations became concentrated in the bucket-ladder dredge, complete units of the sea dredges being towed out from Holland to the East Indies, while land dredges were reconstructed from parts on Billiton.

The recovery of primary tin ore by underground working did not become a satisfactory proposition until the 20th century and was carried out only at a few places on Billiton.

In 1933, the Billiton Maatschappij took over N.V. Singkep Tin Exploitatie Maatschappij (S.I.T.E.M.) which had been operating on Singkep island since 1887.

The third and last place where Billiton is recovering tin ore is near Kamativi, Southern Rhodesia, where it is obtained from pegmatite. In 1951, after years of exhaustive exploitation by prospectors, Billiton acquired a majority interest in a new company—Kamativi Tin Mines Ltd. The daily output of ore at Kamativi has increased from 600 to 1,500 tons and the resultant tin concentrate is smelted on the spot to metallic tin of over 99.5 per cent purity for the Central African Federation and South African markets.

Smelting Operations

Founded in 1928, N.V. Hollandsche Metallurgische Bedrijven at Arnhem, Holland, started with a capacity of about 10 tons daily and 50 men, turning out "Tulip" brand metallic tin (99.75 per cent pure) and "Lamb" and "Flag" brands (99 and 98 per cent pure). Expansion in 1932 led to an increased capacity of 15,000 tons of ore treated per annum and the whole of the Billiton and Singkep ore output for 1933 as well as the 1934 output from the Banka (Netherlands State Tin Mining Enterprise) concern went there. Further expansion sent the figures up to 40,000 tons of ore, yielding 25,000 tons of metal annually. Production was extended to include mixed ores and other metals such as tungsten, bismuth and silver. When supplies of tin ore came to a standstill in 1940-45, lead and alloys took pride of place, while from the still available tin slag mineral wool was manufactured.

Commissioned by the U.S. Government, the Tin Processing Corporation (a subsidiary of the Billiton Maatschappij) founded a smelter in Texas in 1941 where "Longhorn" tin was produced until 1957.

Other Activities

In the field of bauxite mining and recovery a Billiton subsidiary, the N.V. Nederlandsche Indische Bauxiet Exploitatie Maatschappij (N.I.B.E.M.) started operations on Bintan, one of the 1,500 islets that make up the Riouw Archipelago, in 1934 and these continued, apart from the war years, until 1959.

In the meantime, prospecting had been carried out in Surinam and a bauxite-bearing area was discovered. Up to the present, only the Onverdacht and Welgedacht areas have been worked but in the near future the Mocha project, 25 mile from Paramaribo, is to be tackled using modern excavating machinery for overburden removal. In order to share the cost of prospecting for new bauxite deposits, a syndicate has been formed by three foreign bauxite consumers with Billiton as the sole producer-member.

Since its inception the Billiton Company has been widening the scope of its activities. For instance, in 1941, Zaanchemie, a company engaged in the manufacture of synthetic resins, was set up, while N.V. Chemische Fabriek v.h. Dr. A. Haagen, was established at Roermond in 1958 for the manufacture of pigments. In conjunction with other firms, Billiton has also built a titanium dioxide factory.

Since the loss of the Billiton, Singkep and Bintan installations in Indonesia, a number of fresh prospects have opened up in the industrial participation field. One such is the niobium project in Tanganyika, though this is still at the experimental stage. In common with other invited parties, Billiton Maatschappij had submitted a tender and was chosen to carry out gradual development of the pyrochlore occurring there. This is being done in association with the Colonial Development Corporation in London under the title of The Mbeya Exploration Company Ltd. (Mbexco). After thorough geological prospecting, a pilot plant was set up to gain experience in the processing of these ores before proceeding to actual exploitation and the rigging up of a large ore processing installation.

Technical Briefs

Flotation of Pitchblende

A report (No. 603) recently published by the CSIRO (Melbourne) deals with the flotation of pitchblende, both from a synthetic ore and from ores of the South Alligator River District, Northern Territory, the tests being conducted to ascertain whether a high recovery of uranium could be made for subsequent chemical treatment whilst allowing a barren tailing to be discarded.

The most satisfactory collectors for pitchblende were the fatty acids although an ester sulphonate and a resin soap were also found to be effective. The most efficient combination, however, was one combining a fatty acid and paraffin with a suitable collector - emulsifier. When this mixture was used it was possible to make a separation in the presence of slime which is normally marked by reduced recoveries.

This is an interesting parallel to the work done in Sweden by Kihlstedt on hematite ores and the flotation of ilmenite ores at Otanmaki (Finland) by Runolinna without desliming.

The flotation in clean synthetic ore of pitchblende and quartz was found to be rapid with fatty acids, their soaps, a resin soap (Dresenate TX) and Fenopan A (an ester sulphonate) but on the natural ores tested combinations of collectors appear to be more effective. The most effective pH value was found to be between 6 and 7 and flotation from a synthetic ore was good over a wide range of particle size (i.e. from about 150 mesh to at least 7 microns). Various gangue depressants were also tested but did not appear to materially affect the operation on synthetic ore.

On the other hand, when a medium grade natural ore was tested, a combination of tall oil and an ester sulphonate was found the most useful on a deslimed sample and the most satisfactory point of addition was to the grinding circuit. Again gangue depressants were found to be of little help whether the ore was deslimed or not. When the feed was not deslimed, flotation was greatly aided by an addition of paraffin and the combination of a saturated fatty acid (stearic) sodium oleate and paraffin suggested by Aitkenhead and Jaekel for autunite showed promise.

With a high grade ore conditions were found to be similar, but the best compromise between grade and recovery was made with palmitic acid. Shorter chain acids such as myristic and lauric as well as the unsaturated oleic acid produced higher recoveries per unit addition but with reduced selectivity.

As far as the emulsifier is concerned, sodium oleate and peltogen, a sulphonated whale oil, gave the best results. With these mixed collectors, the pH was not as critical and could vary from 6.5 to 8.5 but again gangue depressants had little effect, except for Cyanamid S3223, a synthetic polymer which gave slightly improved selectivity at a pH value of 8.0.

Although recovery of some 80-81 per cent appears possible with an enrichment of just over 3 to 1, it does not seem possible to obtain a discardable tailing on medium or high grade ores. Nevertheless, this work may lead to the economic beneficiation of sub-marginal ores, so that they would stand the transport charges and costs of leaching and it is understood that some further work on these lines is being undertaken.

HEATER FOR METAL PROCESSING

Claimed to hold promise as a furnace for processing metals with ultra - high melting points, a new high-energy electric arc heater with a potential capacity for supplying a stream of gas at a temperature as high as 20,000 deg. F. and pressures as great as 15,000 lb. p.s.i. has been devised by the Westinghouse Electric Corporation in the United States. It can operate for sustained periods of time and at an extremely low level of gas contamination.

Originally planned for application in a wind tunnel for missile testing, the new machine is also expected to find applications wherever gases at very high temperature and pressure can be used to advantage, including the metallurgical industry, where at present there is no practical means of producing temperatures of 10,000 to 20,000 deg. F. in gases at high pressure over a sustained period of time. For instance, as a furnace, the new development might make a number of refractory metals available in ingot form for the first time. Normally used in powder form, metals such as tungsten are difficult to process because of their high melting points.

A prototype model of the machine has been operated at a power input of 1,700 kW., but a high of 30,000 kW. is planned by Westinghouse. The temperature into the nozzle has been maintained at 10,000 deg. F. and the flow from the nozzle has reached a sonic velocity of 3,400 m.p.h. Velocities over ten times the speed of sound are expected when the gases are expanded with a hypersonic exhaust nozzle.

In all its applications, the success of the arc heater depends upon a low level of contamination, since, in many units recently developed, electrodes and walls of the chamber have burned and contributed impurities to as much as 10 per cent of the mass of the gas flowing through the system. In contrast to this the Westinghouse unit has a guaranteed maximum contamination level of 0.2 per cent and still further reductions are contemplated.

A key to the performance of the new machine lies in the design of the two electrodes which form the terminals for the arc. Each of these electrodes consists of a hollow doughnut-shaped ring placed horizontally, one directly above the other. Water is pumped through the hollow rings for cooling. An electric arc is started by drawing it across the gap between the two rings, and then rotated around the gap at a high rate of speed.

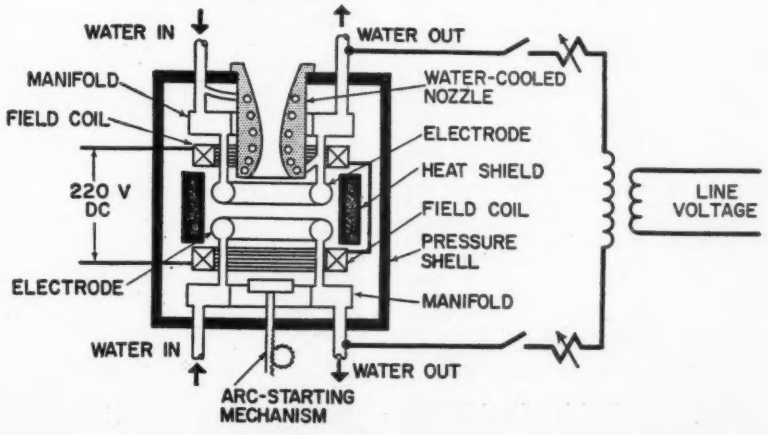
Rotation of the arc is accomplished by a magnetic field from d.c. coils arranged around the outside of the heat chamber. This rotation, combined with water cooling, prevents the electrodes from heating to a point beyond the structural endurance of the material. Repeated tests of the unit have left the electrodes undamaged, indicating a lack of contamination from this source.

The working fluid, such as air or nitrogen, enters the arc chamber and passes into the arc through openings near a water-cooled copper heat shield. This water-cooled heat shield, which can withstand arc temperatures well above 10,000 deg. F. without eroding, protects the walls of the arc chamber. After leaving the arc, the fluid passes through a water-cooled nozzle.

Designed to accommodate a 1.2 lb.-per-sec. flow of either air or nitrogen, the prototype arc heater should be able to supply gas at 1,500 p.s.i. with a constant enthalpy of more than 2,000 B.T.U. per lb. for as long as 10 min. without damage or measurable gas contamination. The efficiency of heat transfer to the gas is in excess of 50 per cent. More that 50 tests of the prototype arc heater have been successfully completed, and testing will continue until the design limits of the equipment have been verified.

So far, the highest pressure at which tests have been conducted is 730 p.s.i. Other tests with a power input of 549

Schematic cutaway of the Westinghouse arc heater



v. and 5,046 amp. (9,450 kW. per lb. per sec.) have raised the enthalpy of air passing through the chamber 4,670 B.T.U. per lb. Equipment developed from the prototype is expected to be available within a year or two.

DEDUSTING AND CLASSIFYING MINERALS

In a paper presented to the I.M.M. Plaskin and Olofinsky have described research into the processes of separation in an electric field of a corona-type discharge, and have shown that it is possible to achieve dedusting and indeed classification of the size fraction from 0 to 8-10 mm. It has been established that the efficiency of dedusting of coal and mineral fines is as high as 95 to 97 per cent, provided the surface moisture does not exceed 5 per cent. Furthermore, besides classification, there is an important possibility that the corona-type classifier can effect the separation of minerals of different specific gravity, and it has been found that the lighter particles are the first to reach the electrode. In this way quartz and magnetite of equal size can be separated.

For the treatment of coal there are also possibilities and electrical dedusting prior to pneumatic cleaning is said to produce less fine material than screening, since there is no comminution of the soft coal as with a screen.

In the system described, the feed is introduced as a thin sheet which falls midway between a vertical corona electrode and the grounded electrode which is often arranged so that the bottom end is further away from the changed electrode than the top.

The corona electrode is made of wire mesh and the earthed electrode provided with orifices through which the fine material passes and falls into a receptacle. The coarser material is less affected by the electrical field and the "electric wind" produced so that it falls clear of the earthed electrode and is thus separated.

FERRO-NICKEL FROM LOW GRADE LATERITE

The first and only large scale nickel plant in the United States has been operating successfully since 1954. It is situated at Riddle, Oregon, and is operated by the Hanna Nickel Smelting Co. a wholly-owned subsidiary of the Hanna Mining Co.

The plant is of particular interest since the treatment is essentially carried out by the Ugine smelting process, developed and patented in France, and involves adding a suitable reducing agent to the mixture of molten oxide ore in the presence of ferrous metals, and agitating vigorously. The ore consists of garnierite with peridotite, and is first crushed to 5 in. It is then dried to 3 per cent—4 per cent moisture and screened. The $+\frac{1}{2}$ in. portion consists largely of hard peridotite and is rejected, except for hand picking any lumps of rich ore. This is followed by crushing to $\frac{1}{4}$ in. and further drying to avoid splatter in the furnace.

Finally, the nickel is reduced by silicon which is added in the form of 45 per cent ferrosilicon at a high temperature in electric furnaces. Agitation of the reducing agent and the melt is accomplished by pouring the material rapidly from ladle to ladle. The process has been described in *Mining World*.

At the Pikalevo and Volkhov alumina works in the U.S.S.R. alumina is recovered from nepheline obtained from the Kola peninsular. The ore, assaying about 30 per cent alumina, 20 per cent potassium and sodium, is wet ground and the resulting slurry mixed with limestone and ignited with coal at 650 deg. C. to 1,000 deg. C. The limestone evolves CO_2 and the calcium oxide reacts with the nepheline to form a clinker composed of dicalcium silicates and water soluble aluminates of sodium and potassium. This solution is treated in an autoclave with CO_2, yielding aluminium hydroxide as well as by-product potassium salts and cement.

*

The importance of surface staining on the electrical properties of minerals is again demonstrated in test work to provide a flowsheet for the treatment of magnetic separator beach sand residues from Capel, W. Australia. This is reported by S. B. Hudson in CSIRO Report No. 583.

Although it was first thought that acid treatment would be necessary to remove iron stains from the zircon, subsequent work indicates that a combination of high tension separation, conductance separation and magnetic separation succeeds in separating ilmenite and leucoxene but leaves products containing rutile, zircon, monazite etc. which are at least poor conductors.

If this mixed material is concentrated by gravity and scrubbed in a rod mill, the resulting gravity concentrate can again be finally cleaned up by the same sequence of operations as used before rod milling, involving the use of high tension, conductance and magnetic separation, as well as further gravity treatment on an air table to finally clean up the monazite.

*

Two major iron ore producers have announced plans to build pilot plants involving magnetic roasting for the treatment of low grade non-magnetic iron ores from the Mesabi Range. Both plants will use kilns supplied by Dravo Corp. under licence from Lurgi of Germany in which the reducing gases are introduced at the opposite end to the feed and fuel is introduced in burners staggered along the kiln wall. It is estimated that a kiln approximately 164 ft. by 12 ft. should have a capacity of 60 to 80 tons per hour.

*

Float Ore Ltd. have announced a new flotation collecting reagent, known as Flotbel R107T-A which is claimed to be a good collector for barite and can be used without any froth controlling reagents.

*

Eigeles (Bull. I.M.M. Aug. 17, 1960) has reported the results of a study of the interaction of fatty-acid collectors with certain oxides and silicates in the presence of activators specially introduced and with surface coatings formed during the processes of mineral formation and grinding in steel mills. It has been shown that not only do cations have an activating effect on quartz and felspar, but also colloidal iron oxide hydrosols have an appreciable influence. The activating effect of iron hydroxide coatings is greatly inhibited, however, by dehydration and crystallation.

While such activation is observed with quartz and felspars, surface formations have a passive effect on some minerals such as corundum, ilmenite and cassiterite.

*

Although it is a common practice to well wash sand and gravel, and screen it, it is unusual to find concentration featuring in a gravel plant. At the plant of the Cleish Sand & Gravel Co. Ltd., at Cleish, Kinross-shire, however, jigs have been installed to remove unwanted constituents such as coal and shale. Not only do these jigs remove this waste but they also separate sand which has passed the screens. Floatex-Meckum jigs are employed supplied by Floatex Separation Ltd., and made under licence from Meckum Engineering of Ottawa.

*

An interesting mathematical analysis for the operation of a fixed bed type of ion exchange unit as well as other methods has been given by M. M. David (L'Echange d'ions comme operation du Genie Chemique) in *Genie Chemique*, Vol. 84. No. 1. Other methods employed to specify the size and processing conditions of an industrial unit are also reviewed, and various factors in the economical study of the process described.

*

A new hydraulic classifier has been announced by Dorr-Oliver for making two products in the 20 to 325 mesh size range and has no moving parts. Classification is achieved by means of water introduction in the bottom of the tank, through nylon jets located on a series of pipe rings, and forms a teeter bed. At a predetermined point, syphons automatically remove the coarse fraction, keeping the fluid bed in equilibrium, and are controlled by float valves.

*

Use of specially grown tungsten crystals as a reinforcing agent has increased the tensile strength of copper by four times. The tungsten crystals act in the copper mixture like glass fibre reinforcements in plastics.

This is the first practical use of the discovery that single-crystal fibres of metal are far stronger than the same metal in amorphous form. The difficulty has been that the shortness of the metal fibres—a millimetre or less—limited their use. When the crystals are forged, they lose their structure and unusually high strength.

The copper-tungsten "composite"—it is not a true alloy—has 35 per cent of tungsten crystals. It has a tensile strength of 120,000 lbs. p.s.i. compared to 32,000 for ordinary annealed copper.

MINING MISCELLANY

The Government of Surinam has granted a concession to the Billiton Maatschappil Suriname to prospect for tin minerals in an area of about 200 hectares. The company has already been doing preparatory work under licence, and full-scale tin exploration will now begin.

★

A lawsuit has been instigated at Leoben, in Austria, by the owner of a magnesite deposit at Wald am Schober, in Styria, to nullify an exploitation contract signed many years ago with the Oestrreichische Alpine - Montaangesellschaft company. This company has not exploited these deposits since 1938, but while the contract remains valid, the owner of the site cannot accept the offer now being made by interested U.S. mining interests.

★

It is reported that a new treatment plant for chromite has been installed at the Co. Dinh mine, North Vietnam.

Mexico is to provide economic and technical aid in the development of bauxite deposits in Panama. Similar aid programmes were also reported to be under consideration in respect of development of Bolivian and Panamanian tin, copper and iron deposits.

★

The first iron ore from the newly-discovered reserves between Salzgitter and Gifhorn in the Western German State of Lower Saxony is to be mined before the end of 1960. The ore will come from the "Konrad I" underground mine of Erzbergbau Salzgitter A.G.

★

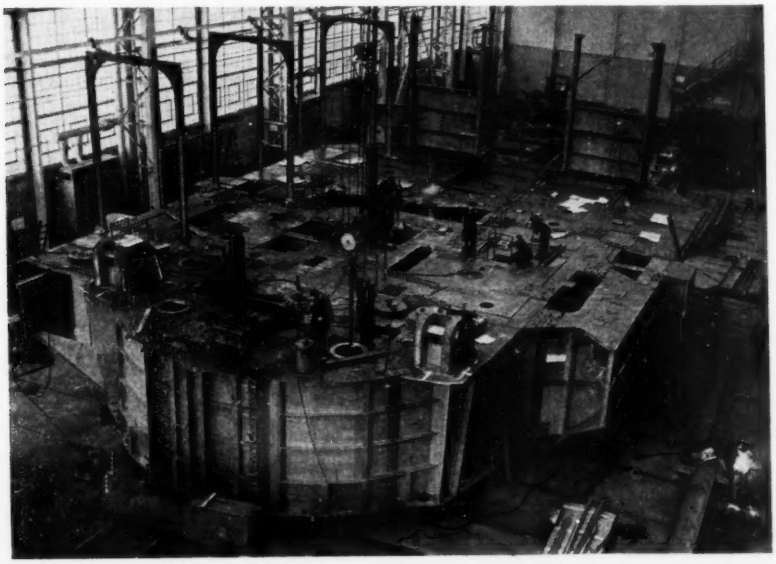
Manganese deposits are reported to have been discovered near Budva, in the extreme south of the Yugoslav Adriatic coast. The deposit is said to contain unusually high-quality ore and it is hoped that if the reserves are sufficiently large they will make manganese imports unnecessary for Yugoslavia.

Walking Dragline for Canada

Another order worth $1,500,000 has come from Canada for a giant electrically-driven walking dragline to be used for coal stripping, this time in the Maritime Provinces, has been received by Ransomes and Rapier Ltd. This contract has been placed by D. W. and R. A. Mills Ltd., coal contractors of Minto, New Brunswick, having been negotiated by the manufacturers' distributors, Gill and Company Ltd. of Saint John.

This is particularly pleasing to Ransomes and Rapier because just about a year ago, in the face of keen competition from the United States, they obtained an order for a similar machine from Calgary Power Ltd. of Alberta and that was the first time a contract for such machinery had been placed in Great Britain for delivery to the North American Continent. Shipment will begin early next year.

The first machine, for Calgary Power, will be shipped via the Panama Canal to Vancouver and then will be taken by rail through the Rockies to the assembly area at Wabamun, near Edmonton. It is expected to be fully operative by the middle of 1962. The second machine is planned to begin work in a year's time and should be operating by the autumn of 1962.



The Mitsui Mining and Smelting Co. of Japan will take up 40,000 contributing 10s. shares in Ravensthorpe copper mines at a paid up value of 8s. per share. The shares will rank equally with existing contributing shares and the balance of 2s. per share will be payable as calls are made. Under the terms of the agreement, Ravensthorpe will sell the whole of its production of copper concentrates to Mitsui Mining. The directors of Ravensthorpe announced further that the purchase agreements are subject to review, and are designed to ensure that Ravensthorpe will receive world parity prices at all times.

★

The Pakistani Bureau of Mineral Resources, as part of their plan for the economic development of coal mines, have selected 20 mines in various places for development, and fixed targets for daily production varying from 100 tons to 1,000 tons. The owners of these mines will be given assistance for the import of necessary machinery and equipment. The Digari mines have been allotted to P.I.D.C. for development along with the coal-bearing area of the Central Sor Range.

★

A gas processing and sulphur manufacturing plant, at an approximate cost of £7,000,000 is to be built by end 1961, in the Pincher Creek district of Southern Alberta, by Shell Oil Co. of Canada. It will initially be designed to produce approximately 100,000,000 cu. ft. of processed gas per day for delivery to Alberta and Southern Gas Co. of Canada, for export to the U.S. In addition, approximately 1,000 tons of sulphur and 3,500 - 4,000 barrels of liquid products will be produced.

★

The French Office National Industriel de l'Azote, of Toulouse, have announced details of trials being undertaken in co-operation with the Schneider-Le Creusot group's subsidiary, Societe Metallurgique d'Imphy, to obtain steel direct from iron ore by means of a new reduction process. Trials so far have shown that, with the use of some 10 tonnes of various ores daily, a high-purity metal powder can be produced, which can be processed to iron ingots, or used in the production of special steels or ferro-alloys. Further experiments at a cost of about 10,000,000 New Francs are now planned, using between 100 and 200 tonnes as the daily sample.

★

The Finnish ferrous metal company, Vuoksenniska Oy, gives the end of 1961 as the date for starting the exploitation operations of iron ore deposits on the bed of the Gulf of Finland. The reserves, known as the Jussarö deposit, consist of between 200,000,000 and 300,000,000 tonnes of ore with an iron content between 25 and 35 per cent.

★

A Yugoslav trade delegation, which has been visiting Cyprus, is reported to be desirous of purchasing large quantities of Cyprus copper, iron pyrites and asbestos.

★

A new programme of co-operative geological mapping by the State of Kentucky and the U.S. Geological Survey is planned to cover the entire state within about 10 years, at an approximate cost of $12,000,000.

Metals and Minerals

Pattern of the Future Uranium Market

Apart from difficulties caused by present over-supply, disorderly prices, and excessive governmental regulation, the seller of uranium has other problems to consider in order to prepare himself for the better times ahead. Not the least of these problems for the producer of uranium mill concentrate, referred to in the trade as "yellow cake," is whether he has the right product to market in the longer term.

This was among the points discussed by Mr. A. F. Lowell, Head, Marketing Department, The Rio Tinto Mining Co. of Canada, in an article contributed to The Annual Review Number of *The Northern Miner*, under the title "Where Will We Sell Our Uranium When Present Contracts Expire?" We shall return to this article in a future issue.

As Mr. Lowell points out, the only possible consumer of "yellow cake" as such is a natural uranium refinery. But between the refinery and the final consumer—the actual nuclear reactor—lies a nuclear fuel fabricating plant, or, prior to this stage if enriched uranium is required, a uranium enrichment plant.

So far no clear pattern has emerged internationally to indicate which is likely to be the most acceptable form of uranium for the longer-term, but whatever definite pattern does emerge is of vital consequence to the miner of natural uranium. Hitherto, quite a number of countries appear to have opted to do their own refining of imported yellow cake. This has involved the building of a fair number of uranium refineries abroad, but the article emphasises that, due to the very small volume of throughput at this stage, these are little more than pilot plants, with correspondingly high operating costs.

If a truly international market existed for refined uranium products, such plants could not possibly compete with the large established refineries of the advanced nuclear plants. Hence Mr. Lowell regards it as at least questionable whether this emerging pattern will definitely crystallize, or whether, on the other hand, these pilot plants will eventually have to be abandoned in favour of importing refined uranium more cheaply, instead of yellow cake, from the uranium producing countries. If this should happen, yellow cake as such would diminish in importance as an internationally marketable commodity. Producers might then find themselves confronted with the alternatives of refining their uranium beyond the yellow cake stage in order to meet the new market pattern, or aligning themselves closely with an established low-cost refiner.

The article also touches on the problem arising from the still unresolved question as to the relative merits of enriched versus natural uranium, for neither of which have clear cut economic advantages as yet been proved in the case of large-scale nuclear power plants. In the case of small reactors and of most nuclear ocean vessels, there is a clear economic advantage in favour of enriched uranium. In the west the production of enriched uranium, an extremely costly business, is virtually a monopoly of the U.S. Should it become established in the next few years that enriched uranium also has the economic edge over natural for large-scale nuclear power plants, then any producer of natural uranium outside the U.S. would find himself in a most invidious position. In effect, virtually his sole market for the long-term would be the U.S., since his material would have to be treated there in the huge American enrichment plants before becoming an acceptable product in the world market.

Ultimately, this particular problem might be resolved by the construction of large-capacity enrichment plants outside the U.S., but as things are that has the appearance of being a very long-term prospect.

Recognition of these problems is reflected by the beginning of a movement among some of the companies on the world uranium mining scene to make associations with refiners and nuclear fuel element fabricators in their own and different countries. Through such links they expect to be in a position to adjust themselves to any changes in the world trading pattern and be in a position always to supply uranium in the form the market wants.

No doubt the future pattern of the world uranium market will be among the questions under continuous study by such organizations as the Canadian Nuclear Association, formation of which was announced in our last week's issue (p. 662).

ALUMINIUM IN JAPAN

The progress of the Japanese aluminium industry and its expansion projects were briefly discussed in our last week's issue, p. 663. Mr. Kikuo Yasuda, chairman of the Japanese Light Metals Association, has since been reported as warning the industry that it would have to "gird its loins" in the near future to face a difficult situation. Mr. Yasuda stated that, if demand expanded as hoped, then *primary* aluminium in Japan in 1961 could be expected to reach 160,000 tonnes in 1960 compared with an estimated 130,000 tonnes this year. Nevertheless the situation still demanded redoubled efforts to increase demand and also to cultivate new uses for aluminium products.

While recognizing that existing refineries could not prevent other firms from trying to begin primary aluminium, Mr. Yasuda stressed that the time was hardly opportune for newcomers to enter this field. Any such newcomers, he considered, should be prepared to operate at a loss for at least several years.

According to recent Japanese Press reports, the Mitsubishi group is planning to start a joint venture with a U.S. company to begin production of primary aluminium, employing new electrolysis techniques developed by a French firm and using bauxite imported from Australia.

★

As from January 6, 1961, Reynolds Metals will temporarily suspend operations at its Arkadelphia, Arkansas, aluminium reduction plant, due to the high cost of power. The plant started producing aluminium metal in 1954 with a rated capacity of 55,000 tons a year and employs about 340 people. The plant's casting facilities will continue to operate.

★

Owing to high inventories of pig aluminium, Alcoa is to suspend production on December 31 at a second potline in its smelting plant at Alco, Tennessee.

Alcoa has followed a price cut of 3/10 c. per lb. on aluminium sheet for can manufacture initiated last summer by Kaiser Aluminum, but stated in its announcement that it was doing so grudgingly to meet competition. The reduction is to 32.2 c. per lb. from 32.50 c., effective from current shipments.

OUTOKUMPU TO MINE KEMI CHROME

The Finnish State mining concern, Outokumpu Oy, has taken over the concession for the exploitation of the Kemi chrome ore reserves, the biggest in Finland and Europe. Provisional estimates put the size of the deposit at over 15,000,000 tonnes of ore with a Cr_2O_3 content of 20 per cent, the main orebody being 10 m. below ground level and some 700 m. wide in a marshy area. Since ore has been found to exist as far down as 250 m., it is expected that estimates of the size of the reserves will have to be revised upwards. Chromite from the site contains some 44-47.5 per cent Cr_2O_3, 19-27 per cent Fe., and 6.5-9 per cent MnO_2. Smelting difficulties are expected on account of the high manganese content and the unsatisfactory chrome-iron ratio.

★

The Greek Government has announced plans to restrict bauxite exports to 1,000,000 tonnes per year from 1963 for a period of 30 years or until either the Franco-Greek-American aluminium concern Aluminium de Grèce itself discovers bauxite reserves or the Greek Government can put at the company's disposal bauxite reserves of at least 30,000,000 tonnes yield under normal conditions, whichever is the sooner. Last year Greece's bauxite production, carried on by five companies, permitted exports of almost 900,000 tonnes, of which 550,000 tonnes went to the Soviet Union.

HIGH PURITY SILICON

The Belgian metallurgical and chemical producer, Société Génerale Métalurgique de Hoboken has announced that, after some months of pilot plant operation, it is now producing electronic qualities of silicon on an industrial scale. Capacity of the Olen plant is being built up to a planned level of one tonne per month.

★

Silicon production is to be started next year at Baric, in the Yugoslav republic of Serbia, at a plant owned by the local firm Prva Iskra. The new plant will have an annual output capacity of some 250 tonnes.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

All prices showed a downward movement in the period under review, but it would still be wrong to say that the undertone in any of the markets, other than lead, is particularly weak. The price adjustment partially stems from declining consumer interest due to the approaching holiday season.

L.M.E. COPPER STOCKS TIGHTLY HELD

In spite of the tight technical position in the market, both the price level and the backwardation show declines at the time of writing. It is still the general opinion, however, that the backwardation will again increase between now and the end of the year with a probable rise in the general price level as well. Stocks in official warehouses remained almost unchanged at the beginning of the week at 12,700 tons. It is believed that a high proportion of this is held in firm hands, and that some exports of wirebars will be recorded before the end of the year.

In Chile the strike negotiations at El Teniente are following the time-honoured path, although the Minister of Labour has been called in as a mediator somewhat earlier than is usual; it is probably this fact which has had some influence on the London market, although there are observers who point out that should conciliation fail a fairly lengthy strike is inevitable. In the U.S. the market has been quiet with some interference to trade from climatic conditions.

The Copper Institute figures for November are generally most encouraging, both for the U.S. and outside. In the U.S. refined production was virtually unchanged at 149,277 s.tons (151,497) while deliveries at last showed an upward trend at 99,749 s.tons (93,451). End of month stocks at 130,254 s.tons (113,417) were about in line with forecasts.

Outside the U.S. refined production was little changed at 158,420 s.tons (156,901) while deliveries to fabricators were unexpectedly well maintained at 186,271 s.tons (187,081). It is also regarded as a bullish factor that end of month stocks showed only a small increase at 297,938 s.tons (294,735).

BUY TIN NOW!

The tin market has remained relatively steady and, had it not been for the time of the year, it is thought that prices would have firmed up following the decision of the International Tin Council to permit the continuation of free exports, combined with the remark of their chairman that the market was in a healthy state. The majority of experts still predict a shortfall in production during 1961. As it is expected that the new U.S. administration will take steps to improve trade in general, the present price level in London may well prove to be virtually the low point for 1961. Stocks in official warehouses remain almost unchanged at 9,167 tons, of which a very large proportion is held by the buffer stock manager.

On Thursday the Eastern price was equivalent to £798¼ per ton c.i.f. Europe.

LEAD AND ZINC WEAKEN

The lead and zinc markets have both shown weakness in anticipation of a reduction in the U.S. quotations which became fact on Tuesday. In the U.S. imported lead and zinc have been selling at prices appreciably below the official quotations, and with the settlement with New Jersey and at Bunker Hill it is not surprising that the lead price has been reduced by 1 c. to 11 c. per lb. East St. Louis, whilst the zinc price has been reduced to 12½ c. per lb. East St. Louis. Demand for both metals remains moderate and in the case of lead additional attention is being paid to stocks in producers' hands.

The U.S. statistics for November showed that production totalled 60,841 s.tons against 63,005 s.tons in October. Domestic shipments were down to 56,981 s.tons from 58,572 s.tons in October but exports, especially to Japan, showed a very appreciable rise to a total of 11,999 tons against only 6,611 tons in the previous month. This resulted in the end of month stocks showing an appreciable fall to 182,149 tons as opposed to 190,288 tons at the end of the previous month.

Closing prices are as follows:

	December 8 *Buyers*	*Sellers*	December 15 *Buyers*	*Sellers*
COPPER				
Cash	£234¼	£234¾	£229¼	£229½
Three months	£231¼	£231½	£226¼	£226½
Settlement	£234¾		£229½	
Week's turnover	10,800 tons		8,075 tons	
LEAD				
Current ½ month	£66	£66¼	£64¾	£65
Three months	£67¼	£67½	£66¼	£66¼
Week's turnover	7,750 tons		8,850 tons	
TIN				
Cash	£798	£798¼	£798¼	£799
Three months	£795¼	£796	£796	£796½
Settlement	£798¼		£799	
Week's turnover	560 tons		745 tons	
ZINC				
Current ½ month	£86¾	£87	£81¾	£82
Three months	£86	£86¼	£82	£82¼
Week's turnover	5,075 tons		8,525 tons	

LONDON METAL AND ORE PRICES, DEC. 15, 1960

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £200 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11z. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 253s. 3d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28½/£28½
Quicksilver, £69¼ ex-warehouse
Rhodium, £43/£45 oz
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79¼d. f. oz. spot and 79½d. f'd.
Tellurium, 28s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis .. 21s. 6d./22s. 0d per unit c.i.f.
Beryl (min. 10 per cent BeO) .. 240s./245s. per l. ton unit BeO
Bismuth .. 65% 8s. 6d. lb. c.i.f.
18/20%1s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (semifriable 48%) (Ratio 3 : 1) .. £15 5s. 0d. per ton c.i.f.
„ Hard Lumpy 45% (Ratio 3 : 1) .. £15 10s. 0d. per ton c.i.f.
„ Refractory 40% .. £11 0s. 0d. per ton c.i.f.
„ Smalls 44% (Ratio 3 : 1) .. £13 5s. 0d. per ton c.i.f.
Baluchistan 48% (Ratio 3 : 1) .. £11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1) $Nb_2O_5 : Ta_2O_5$ 175s./176s. per l. ton unit c.i f.
Fluorspar—
Acid Grade, Flotated Material .. £22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2) .. 156s. 0d. ex. works
Lithium Ore—
Petalite min. 3½% Li_2O .. 50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O .. 50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O .. 75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. £21 0s./£23 0s. d/d
Manganese Ore Indian—
Europe (46%-48%) basis 60s. 0d. freight .. 73d./75d. c.i.f. nom.
Manganese Ore (43%-45%) .. 69d./71d. c.i.f. nom.
Manganese Ore (38%-40%) .. nom.
Molybdenite (85%) basis .. 8s. 11d. per lb. f.o.b.)
Titanium Ore—
Rutile 95/97% TiO_2 (prompt delivery) .. £28 0s. 0d. per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2 .. £11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%) .. 148s. 0d./153s. 0d. per unit c.i.f
Vanadium—
Fused oxide 95% V_2O_5 .. 7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2 .. £16/£16 10s. ton c.i.f

Mining Finance

Rand Selection's Metamorphosis

The rumours about Rand Selection proved to be well wide of the mark when the official outline came of the proposals to make this member of the Anglo American Corporation of South Africa group into a major channel for U.K. and U.S. funds to flow into the Union's development projects. The recent speculative buyers scuttled out fast when they found that the company was not, after all, to be taken over at a materially higher price. Very much the opposite, it is Rand Selection that is doing the taking over, and instead of a bid for their shares, holders now face the prospect of being asked to put up fresh money by way of a rights issue in the proportion of one new share for every ten held. No price has yet been announced so the extent of the bonus element in the offer is unknown. As a result of all this the 5s. shares dropped from 60s. 7½d. to 56s. 3d. They were up to 75s. in the early part of the year.

The details of the new scheme are still to come, but the broad outline is as follows. The crux of the operation is the taking over by Rand Selection of De Beers Investment Trust, at present a subsidiary of De Beers Consolidated, and the means by which years ago some of the millions from diamonds were channelled into the gold mines of the Orange Free State. But first D.B.I.T. is itself to be enlarged. "Certain assets" are to be transferred to it by subsidiaries of the British South Africa company (chartered) and by Anglo American. D.B.I.T. will also absorb the entire share capital of Rand American Investments (Pty.), the Johannesburg company representing the Engelhard and International Nickel interests and which also has a substantial stake in Central Mining and Rand Mines. These acquisitions will be made by means of share issues by D.B.I.T. and an issue will also be made to Johannesburg Consolidated.

ASSETS OF OVER £100,000,000

Rand Selection itself proposes to raise its capital from 7,500,000 5s. shares to approximately 32,650,000 shares of which, as already mentioned, 750,000 will be offered to shareholders in the ratio of one for ten at a price still to be determined and some 24,400,000 will be used to acquire the entire share capital of De Beers Investment Trust, making it a wholly-owned subsidiary. At present market prices this will make Rand Selection's net assets over £100,000,000, divided up as to 44 per cent gold mining, 30 per cent mining finance, 9 per cent copper and other base-metal concerns, 8 per cent industrial and sundry companies, 8 per cent loans, property and net current assets and 1 per cent coal mining.

The British South Africa Company ("Chartered") will have an important holding in Rand Selection in place of a considerable number of individual companies operating in South Africa. And in keeping with its enhanced status Rand Selection is to have its share in new Anglo American business increased to one third of the parent house's participation. The official reason given for this huge and rather complicated re-distribution of assets is that it will enable Rand Selection "to fulfil a significant role in the further development of Southern Africa. With its own wide resources, as well as those of the important financial groups which back it, the enlarged company should enjoy a very favourable position to raise capital for new enterprises, on a large scale if necessary". Here, in fact, is a recognition that the public overseas cannot at present be relied upon for the provision of fresh capital for South African ventures, and that growing reliance must be placed on institutional funds such as the growing investment resources of the London-based Chartered company and whatever U.S. funds Rand American Investments may be able to command.

It is obvious that only a small proportion of the enlarged Rand Selection will be held by the public, maybe little more than 15 per cent. So the shares will presumably be a market pretty tightly controlled by the "shops" and the company itself very much of an institutional investment club. It seems likely that shareholders may get fairly generous terms for the rights issue because this is their only real participation in this big financial manoeuvre. No official guidance is given as to future dividend prospects. This will presumably be forthcoming when the new shares are actually offered. In the meantime, after the price setback, shareholders would now appear to have every incentive to await events. More official news is promised "early in 1961". The dividend for the year to September was 2s. 9d. making the current yield 4.9 per cent before double tax relief.

	June 1959	*Dec.* 1959	*June* 1960	*Dec.* 1960
	s. d.	s. d.	s. d.	s. d.
Blyvoor	1 1	1 2	1 3	1 3·6
Brakpan	4½	6*	4½*	6*
City Deep	7½	7½	7½	8·4
Cons. Main Reef	1 6	1 3	1 6	1 6
Crown	1 9	2 0	2 0	2 0
Daggafontein	2 3	2 3	2 0	2 0
Dominion Rf.	1 6	1 6	1 6	1 3
Doornfontein	1 6	1 6	1 6	1 4·8
Durban Dp.	1 6	1 6	1 6	1 6
E. Champ d'Or	3	3	3	3
East Dagga	7½	7½	7½	9
East Geduld	1 9	1 11	1 8	1 9·6
E. Rand Pty.	1 9	1 9	1 9	1 6
Geduld	4 9	5 0	3 4	3 7·2
Grootvlei	1 1	1 5	1 1	1 4·8
Libanon	3½	3½	4½	4·8
Luipaards	1 0	1 0	1 0	1 0
Marievale	1 4	1 7	1 6	1 10·8
Modder B.	—	6	—	6
Modder East	6	6	6	6
Randfontein	1 9	2 3	1 3	1 9
Rand Leases	—	1 0*	6*	6*
Rand Mines	3 0	3 0	3 0	3 0
Rietfontein Cons.	6*	8*	6*	7·2*
Springs	—	6*	—	6*
S.A. Land	1 3	6	6	6
Sub Nigel	1 6*	1 3*	1 3*	1 3*
Vaal Reefs	1 6	2 0	1 6	2 0
Venterspost	10½	10½	1 0	1 0
Vlakfontein	11	1 0	11	1 1·2
Vogel	11*	10*	8*	8·4*
W. Driefontein	4 3†	4 9†	2 7½	2 10·8
Western Reefs	1 3	1 3	1 3	1 3
West Wit.	1 9	1 10½	1 10½	2 0

* Return of capital. †Before 100 per cent share bonus.

MR. MENELL ON S. AFRICA'S CAPITAL NEEDS

At the Anglo-Transvaal meeting Mr. S. G. Menell also dwelt on this problem of South Africa's capital needs, one that the business community there is perpetually worried about but which seemingly still leaves the Nationalist Government completely unmoved. Mr. Menell joins many other industrial leaders in being under no illusion as to the impossibility of South Africa supplying all its capital requirements from internal resources. He is quite frank about the challenge that this necessity for oversea capital offers. It is "whether we shall have the intelligence and the political courage to shape our policies to encourage investment of new capital in our enterprises".

Mr. Menell was travelling in the U.S. during the October gold flurry in the London bullion market and he devotes a large part of his speech to his impressions there of American reactions to the gold price question. His conclusion is encouraging to gold shareholders. The belief he has had for some time that a rise in the American official gold price will take place sooner rather than later has been strengthened. Perhaps the chief disappointment of his speech is that he does not seize the opportunity to comment on recent talk that New York's Kennecott Copper Corporation is endeavouring to pull out, albeit at a substantial loss, from its heavy investment in the group's Virginia and Merriespruit mines in the O.F.S.

Mr. Menell's speech is reported on page 694.

FEW KAFFIR DIVIDEND SURPRISES

The beginning of the Kaffir dividend season was commented on here last week. Since then it has been concluded and the balance of the half-yearly payments are detailed in the table alongside together with those for the three preceding half-years.

On the whole the season has been satisfactory but certainly not sensational. It does not, of course, include the declarations from the Orange Free State companies which have their " little " seasons in March and September.

It does, however, include dividends from such forward-striding giants as West Driefontein and there has been the usual advance in this concern's distribution. It is fairly safe to say even at this early stage that there will be another one next June. West Wit Areas which has a large shareholding in West Driefontein has increased its interim for the year to next June by a small amount and should also pay a higher final.

Of the older mines, East Daggafontein sprang a little surprise by declaring slightly more at a stage of its life when this had not been expected. And Marievale came up to the best expectations by raising its total dividend for 1960 to 3s. 4.8d. against 2s. 11d. for 1959, putting the 10s. shares at 29s. cum dividend on a yield basis of 12 per cent before allowing for double tax relief. Share prices are expected to go ex the present payments in London on December 30 — unusually on a Friday owing to the Stock Exchange being shut on January 2 — and in Johannesburg on this latter date.

NEW LIFE FOR " FREDDIES " ?

Mr. D. A. B. Watson gives a hint that more money may be wanted in due course by Free State Development and Investment Corporation, usually known as " Freddies ". Very often any such hint is taken as a bear point for the shares concerned, but in this particular case it can be probably read the other way. It means that " Freddies ", which at one time sank into a state of lethargy owing to its main venture, Freddies Consolidated, having turned out badly, is still regarded by the parent house, Johannesburg Consolidated, as a worth-while vehicle for future operations.

Consequently, " Johnnies " is giving the company participations in its widespread exploration programme in South Africa quite apart from " Freddies " own search for a payable extension of the Vaal reef to the south of the present Klerksdorp gold field. The results to date from this search lead Mr. Watson to the opinion that the reef may be of economic interest here. So, " Freddies " is to put down two further boreholes.

The other explorations in which the company is interested are firstly in that adjacent to the budding Western Areas mine (in which " Freddies " is a shareholder) where its interest is 20 per cent; secondly in an area to the north of the new Kinross gold field in the Far Eastern Rand; thirdly in " one near the Klerksdorp goldfields " and fourthly one in the Kroonstad area. In all these latter three " Freddies " stake is approximately 12 per cent. It is obvious in these circumstances that " Freddies " 5s. shares at 6s. 6d. cannot be classed as other than a speculation. But at this stage there does not seem to be a lot to lose. And a lucky strike could bring useful capital appreciation.

MALAYAN TIN DISAPPOINTS

Somewhat naturally Malayan Tin had been assumed to be one of the Far Eastern tin producers that was well placed to take full advantage of the de-restriction of output that came about under the International Tin Agreement on October 1 and which has now been extended to at least March 31 next. The assumption had been made owing to this company's big new dredge which had helped boost sales and profits in the year to last June. Now comes the statement by the chairman that it is not expected that production during the current financial year will be as high as that for 1959-60. The reason is that two of the company's dredges have now worked their way into ground containing lower tin values.

The 5s. shares promptly fell. And as if to rub the point home a first interim of 9d. per share was declared for 1960-61, whereas the sister company, Southern Malayan, which distributed exactly the same as Malayan last year, is paying 1s. 3d.

The dividends are hard to compare with last year's pattern because for that period there were four interims and a final. Henceforth there are to be only two interims, in December and June, and a final to be recommended at the annual meeting in December. The market, however, naturally now assumes that Southern Malayan will improve on last year's total of 2s. 6d. to quite a useful extent whereas Malayan possibly may not. So Malayan have come back to 23s. and Southern Malayan have improved to 21s.

On the face of it, it still looks rather odd that Malayan should be the higher in price. One of the reasons for this is that the company has the longer life prospect. The official estimate for three dredges is the " conservative " one of at least 35 years whereas for the main part of the Southern Malayan property the estimate is 10½ years for five dredges. The latter concern, however, has life prospects beyond this for one dredge on another property and the main property holds out hopes of being economically re-workable by a deeper-digging dredge.

The chief lesson to be learned from all this is that neither share should be sold at the present juncture in a tin share market that seems to have got over the prolonged shake-out that followed the initial rise which started in the long hot summer of 1959.

DIAMOND PRODUCTION IN THE KASAI

Diamond mining in the Kasai (the main source of supply for natural boart), which was interrupted some months ago by the onset of tribal warfare, shows signs of recommencing. Reports from the Congo, which suggest that production may even have already recommenced on a small scale, state that the United Nations' Ghana brigade, which is stationed in the Province, now feels able to give adequate protection for the resumption of operations on a substantial scale.

This report presumably refers to the Bakwanga deposits managed by Forminière, which are centralized and more easily protected than are the Bècèka bush operations at Lubilash and Luebo. Forminière is understood to be taking steps to reassemble the necessary Belgian personnel at Bakwanga and with the cessation of tribal fighting the African miners, who had taken refuge in the bush, are also returning.

(*Continued on page* 696)

LONDON MARKET HIGHLIGHTS

South African gold shares pursued a quiet and rather sedate course this week. If at times the tendency of share prices was lower it was almost entirely due to a lack of fresh buying incentive despite the steady rise in the price of gold on the London Bullion Market. Among the few features of the week was the sharp setback in Rand Selection which followed news of the long awaited financing scheme. The shares dropped from 61s. 3d. to 56s. 3d. when speculators found that instead of the popularly rumoured take-over at 70s. there was to be a " rights " issue at unspecified terms.

Otherwise, share prices moved narrowly. An exception was Free State Geduld which weakened further to 123s. 1½d. following continued Johannesburg offerings linked with pessimistic talk in that centre concerning the annual report due in January. On the other hand, Johannesburg stayed a persistent buyer of Welkom (17s.) and Western Areas (19s.).

In the diamond group, De Beers rose 1s. 10½d. to 152s. 6d. following consideration of the company's role in the new Rand Selection set-up.

Base-metal share markets were enlivened by the long overdue revival in tin shares. Prospects of the Malayan companies remain as good as ever and the steady stream of improved company results testifies to the already good earnings situation. A feature of the movement was the rise of 2s. 3d. to 21s. in Southern Malayan following the chairman's forecast of higher production in the current year coupled with a much higher than expected first interim dividend. The sister company, Malayan Tin, sank 1s. 6d. to 22s. at one time following the official expectation that outout this year may not reach the 1959-60 level together with a rather disappointing first interim dividend. Later, however, the shares recovered to 23s. following some buving from Singapore. Otherwise the market was generally happier. Tronoh rose to 36s. 3d., Tanjong to 23s. 3d. and Siamese to 11s. 9d. Kepong, 9d up at 9s. after 9s. 6d., reflected news of a first interim of 1s. compared with a total of 3d. for 1959-60.

Copper shares were again left alone, business being subdued by the current meetings of the Federal Review Conference. But after some earlier dullness, share prices tended to improve later in the week. Nchanga hardened to 47s. 6d. and Rhodesian Anglo American to 57s. 9d. Messina, the Transvaal and Southern Rhodesian producer, rose to 15s. 9d. in front of the annual report for the year to September 30.

Australian issues were generally firmer, the one notable exception being Lake View and Star. The shares of this gold producer toppled from 31s. 9d. to 25s. 9d. following the chairman's warning that lower profits and dividends may result from the constant rise in wage costs

Lead-zinc issues, however, tended to improve despite the weakness in current prices of the metals. Consolidated Zinc were notably better with a recovery of 3s. 3d. to 64s. 6d.

ANGLO-TRANSVAAL CONSOLIDATED INVESTMENT COMPANY, LIMITED

CHAIRMAN'S REVIEW

Permanent Revenue Sources Show Increase

Industrial Companies Make Satisfactory Progress

Gold—A Bond with the West

The twenty-seventh annual general meeting of the Anglo-Transvaal Consolidated Investment Company Limited, was held in Johannesburg on Friday, December 9, 1960.

Mr. S. G. Menell, the chairman of the Company, presided and in the course of his address to members said:

"I have pleasure in submitting for your approval the Annual Report and Accounts for the twenty-seventh financial year ended June 30, 1960. The profit reflects a continuance of the progress which has marked your Company's operations over the last ten years, especially from sources of permanent revenue.

The total profit of £1,414,800 compares with £1,258,300 for the previous year. After deducting interest paid, depreciation and provision for taxation, an amount of £1,032,300 was carried forward to Appropriation Account. This figure, together with the credit balance at June 30, 1959, made available for appropriation £1,424,700, of which an amount of £202,400 was written off investments, a transfer of £85,000 was made to provision for exploratory expenditure and the payment of Preference and Ordinary Dividends absorbed £654,600. This left a balance of £482,700 to be carried forward to the current financial year.

The Balance Sheet discloses an excess of assets over liabilities of £7,234,000, to which figure can be added the surplus of £2,324,000 by which the market value on quoted investments exceeded the book value at June 30, 1960.

Revenue Reserves

There could also be added to the revenue reserves of £4.3 million an additional amount of £1.6 million being your Company's proportion of the undistributed net profits of its subsidiary companies. As at yesterday's date the market value of your Company's portfolio showed an increase of £400,000 over the figure as at June 30, 1960.

A summary of the operations of our various interests is included in the Report before you so I will confine my remarks to matters of a more general nature.

The last quarter of the year under review was characterized by a great deal of civil unrest, which culminated in a proclamation of a State of Emergency. Inevitably these events, coupled with world-wide criticism of our political policies, were reflected in the downward turn of share market values as well as in disturbed trading conditions generally throughout the country.

Despite these difficulties the companies in Anglo-Transvaal Industries have, in general, made satisfactory progress and their consolidated manufacturing and trading profit reached a total of £2 263,000 during the year.

As far as the mining industry was concerned, it is significant that the civil unrest which took place during the early part of the year in no way affected it, neither in regard to its production, nor in regard to its labour relations.

The circumstances which gave rise to the State of Emergency are well known. It must be recognized that the urban African is part and parcel of our economic life and occupies the same relative position in our industrial sphere as did the worker in the industrial revolution which took place in Europe and in America during the last century; therefore, if we are to live with the world we in South Africa will have to create new conditions which will take account of man on civilized standards and merit, irrespective of colour.

New Approach

In an emergent Africa, the material achievements of our country should place it in the lead of all development on the Continent. But at the same time in order to keep the lead in this development we must modify our approach to the rest of the world. South Africa could well be the workshop of Africa but to fulfil this natural destiny we must come to terms with Africa just as we must come to terms with the world. Events in the rest of the Continent will inevitably have their repercussions on the Union. It is too much to expect that we shall avoid unrest of some kind for that has always been the pattern of industrialization of the older countries. I would therefore ask our friends overseas not to take the news of such unrest out of this context.

The loss of confidence shown in South African investments by overseas investors is a serious setback to both our present economic stability and to our future development. Yet most of this loss of confidence is due to the judgment of South African affairs against a set of standards which make no allowance for practical local conditions and the special circumstances attached to South Africa. Serious political risks accompany investment in almost every country of the world today and certainly every developing one. The greater the industrial future the greater is that political risk, whether it comes from internal factors or from external influences. In South Africa that political risk is no greater than in many countries which now attract overseas investment. The operation of an overseas capital investment is obviously different from that of a domestic venture and it seems to me that just as the overseas industrialist allows for that fact so the overseas investors should permit greater latitude for the customs, preferences and laws of this country.

South Africa offers great investment potentialities. Our currency is stable with a high gold backing. In the economic sphere we are free from radical changes of principle; the environment here is one which is rewarding to the private *entrepreneur;* the living standards of our lowest wage earners, even though they merit examination and improvement, are higher than those in any other African State.

Economic Magnet

This country acts as a magnet to hundreds of thousands of non-white men from other African territories who come here of their own volition, some legally, others in spite of legal barriers—to seek work and gain material advancement. There is a general desire to improve both the productivity and the wages of the non-white worker whose purchasing power has shown considerable increase year by year. South Africa offers a profitable and expanding field of investment for those who are prepared to look beyond temporary difficulties. It is significant that notwithstanding the civil unrest we experienced earlier this year the Group was successful recently in raising in London £1½ million of a 6½% Loan Stock Issue for its industrial holding company.

The gold mining industry which this year will produce £270 million worth of gold will, no doubt, continue to be the spinal cord in the country's economic development. Over the next 10 years there should be a progressive increase in the production of gold although during that period many of the older mines will shut down. Although the new mines have contributed substantially to maintaining the production of gold at a high level, as some of the older mines pass their peaks there grows a need — an urgency—to establish new mines to replace the industry's depleting reserves.

Intensive Drilling

Many intensive drilling programmes in numerous divergent areas are now being undertaken and it is to be hoped that in due course these will lead to the inauguration of new mines. But the finding, establishment and development of new mines is dependent upon large amounts of capital being available and it is a matter of great regret that in these days when confidence is most needed to assist this development and expansion we have lost the confidence of so much of the investing public overseas.

Gold—A Bond

Nevertheless, South Africa's production of gold binds us economically and irrevocably to the rest of the Western world, and economic bonds carefully built up, and dating back to the days of the first discovery of gold on the Rand, will continue to preserve that partnership which has conferred many benefits on us as well as on those countries who initially provided the capital to develop South Africa's latent wealth.

Overseas Capital

This country's tangible links, particularly with Britain and the sterling area, are of great importance to the gold mining industry and to the economy of the country as a whole. As a member of the Commonwealth, we have access to a wide capital market, an important section of which is represented by private investment trusts, and some of them are precluded by their Trust Deed from investment funds outside the Commonwealth. Strong as our internal resources are and significant as is our increasing capacity for generating income, yet the full capital requirements of this country cannot for many years be found internally. We are still in the midst of an industrial revolution and the economic and social changes inherent in that upheaval will demand expenditures which will place a heavy burden on our financial resources. To be able to supply these funds, in addition to those required for normal development of industrial and mining ventures and risk capital for future investigation, exploration and development, is well beyond the capacity of this country should it have to rely only on its own resources.

American View-Point

During the October flurry in the London gold market I was travelling in the U.S.A. and had an opportunity of assessing the American public's reaction to the prospect of an increase in the present official gold price of $35 an ounce, which might mean a devaluation of the dollar. The result was astonishing. People in all walks of life right across the country expressed strong objection and it was difficult to find an American who favoured an increased gold price. The general reaction against what they termed "debasing the dollar" was so strong that I left the States convinced that a price change was not imminent.

New York bankers claimed that if they established a free gold market similar to the Bullion market in London to which the official price could be linked, it would only result in a repetition of what happened during the Korean war when the unofficial gold price rose to over $50 an ounce and subsequently came back to $35 an ounce.

Although I was informed in Detroit that the unemployment figure was the highest for 20 years, industrialists still maintained that it was absurd to consider devaluing the American dollar whilst the country possessed such vast natural wealth and industrial potental.

Prominent bankers in Chicago and San Francisco stated that American gold holdings could be reinforced from American assets abroad, which exceeded the foreign dollar holdings in America by $22 billion. They added that the deficit in the American balance of payments presently running around $3½ billion per annum could be corrected against the $4½ billion per annum being expended on foreign aid.

The man in the street when asked about the prospect of a higher gold price retorted "why should we make Russia such a gift".

Everybody in the States appears to be convinced that a higher gold price would create uncontrollable inflation and the collapse of the dollar, which they fear may occur on a scale no less disastrous than that encountered in the past by some European currencies.

Whatever merit is contained in these opinions, we must face the fact that the American public is unanimously against an increase in the gold price and regards the maintaining of the present price as a matter of national prestige. Consequently it is this adverse public opinion which is a major hurdle to be overcome before any American Government will increase the price.

Signs of Change

I feel, however, that there are signs of a change.

Last month *The New York Times* published an article from which the following is extracted:

"Gold has a drama and a glamour surpassing that of any other material known to man and has remained since the earliest recorded history an article of ultimate value. . . . Gold was a symbol of wealth in the ages when spices or glass or feathers were equally symbolic of riches. Though spices, glass and feathers have vanished from our vocabulary of wealth, gold has remained and promises to continue to remain to the end of time. . . . When times are good, we accept the paper money as real money. But when disaster threatens, when the chips are down, we begin to regard paper money as play money and only gold holds permanent value for us. . . . The laws of the market place and the laws of the nations cannot destroy this immutable logic."

Gold was News

It is to be hoped that such views gain acceptance among the American public. It is noteworthy that at the time of the Presidential election when most other news matters were relegated to the back pages of newspapers, gold for the first time in contemporary history became a topic of general conversation. For the first time it seemed to me gold achieved an economic significance in the mind of the American public and ceased to be solely a metal to associate with jewellery and dentistry. This public awareness I find most encouraging and regardless of all the views to the contrary, it strengthens the belief I have had for some time—that an increase in the American official gold price will take place sooner than later.

South Africa today is a changing industrial structure. The challenge it offers is whether we shall have the intelligence and the political courage to shape our policies to encourage investment of new capital in our enterprises. I believe we shall succeed, because I am confident that we will work out a satisfactory solution for our domestic problems, as indeed we must, if we are to survive as a healthy progressive nation."

The Chairman then expressed his appreciation of the assistance he had received from his Co-Managing Director, Mr. B. L. Bernstein and his other colleagues on the Board, and to them and to the staffs in the Head and London offices of the parent company and at all the mines and industries of the Anglovaal Group. he expressed thanks for the services rendered during the year under review.

The Report and Accounts for the year ended June 30, 1960, were adopted and the retiring Directors, Messrs. M. G. Deacon and Anton Gray were re-elected. The joint Auditors' remuneration for the year was fixed.

The increase in the maximum number of Directors of the Company from eight to nine was duly approved.

Coming Events

The Royal Institution of Chartered Surveyors have announced their lecture session for 1960-61, among which are included "Share Valuations: why and how?" by Mr. T. A. Hamilton Baynes, on February 6, 1961, at 5.45.

*

The North of England Institute of Mining and Mechanical Engineers Associates' and Students' Section will hold the following meetings: Jan. 26, 1961, at 6.45 p.m., when Mr. W. W. Sweet will speak on "The Anbauhobel Installation at Havannah Mine" and May 27, at 2.45 p.m., for annual general meeting. Mr. P. Hutchinson will speak on "Australian Mining".

An International Symposium on Agglomeration is to be held, under the auspices of the American Institute of Mining, Metallurgical and Petroleum Engineers, in Philadelphia, April 12-14, 1961, and among the representatives attending will be 85 from 25 foreign countries. This Symposium will follow directly upon the 44th Annual National Open Hearth Steel Conference and Blast Furnace, Coke Oven and Raw Materials Conference of the Metallurgical Society of AIME, from April 10-12.

*

The Institution of Plant Engineers will be holding a Symposium on Lubrication Engineering, consisting of four papers, on March 23, 1961, in the Meeting Hall of the Institution of Mechanical Engineers. The symposium will be open to non-members and those wishing to attend should make early application for registration forms to the Secretary of the Institution of Plant Engineers, 2 Grosvenor Gardens, London, S.W.1.

*

An International Exhibition of Fire Fighting Equipment, Safety Appliances and Radiation Protection (Interschutz) is to be held in Cologne, West Germany, from June 23 to July 2, 1961, organized by the Association for the Advancement of Protection against Fire in Germany and the Colgne Fair Authorities. Further information may be obtained from the U.K. representative, Mr. M. Neven Du Mont, 123 Pall Mall, London, S.W.1.

MINING FINANCE—*Continued*

GEOMINES' TIN MINES TO RE-OPEN ?

Monsieur A. Guillaume, president of Geomines, told the annual general meeting this week that the working of the tin mines at Manono (north Katanga) could possibly be resumed next January. Working of the mines stopped on September 14. The president said that no noteworthy damage was done to the mines or equipment by the Balubu revolt. No date was given for the payment of dividends. It will be left to the discretion of the board of directors following discussions with the Belgian Government.

SOME CAPITAL REPAYMENTS

Springs Mines announce a second capital repayment of 6d. leaving a balance still repayable of 3/9d. on shares which now have a nominal value of 3d. *Brakpan Mines* announces a third capital repayment of 6d. leaving a balance of 3/4½d. on shares which now have a nominal value of 3d. *Government G.M.A.* announces a seventh capital repayment of 3d. leaving a total of 1/9d. per share still repayable on shares with a reduced nominal value of 3d. It will be recalled that the directors have already issued a warning that the operations of the company may not permit a full return of capital. The payment of this seventh instalment is to be deferred until February 17 i.e. until after the introduction of the new decimal coinage in South Africa on February 14. Consequently repayment to shareholders on the South African registry will be at the rate of 2½ cents in the new currency.

Nchanga and R. Broken Hill Interims Unchanged—Nchanga Consolidated has declared an interim dividend of 1/6d.net. Rhodesia Broken Hill has declared an interim of 3d. per unit net. Both these interims, which are unchanged from last year, are declared after deduction of Federal and Territorial tax.

Tweefontein United Pays More—Despite a lower estimated profit after tax for the current year to December 31 of £127,400 (£141,570) Tweefontein United Collieries is making a final dividend payment of 10½d. per share against 9d. last year. Interim and final dividends will absorb £108,437 (£97,594) leaving the carry forward little changed at £36,430.

Tehidy Minerals Scrip Issue—To bring the issued capital of Tehidy Minerals more into line with the present value of the company's property it is proposed to write up the property accounts by £73,500 to a total of £74,116 and then to make a one for one scrip issue to shareholders registered on December 31. A warning is issued that this should not be taken to imply that total dividend distribution will be any greater.

Union Minière's Interim—Union Minière, the big Katanga copper producer, has now announced understandably somewhat later than usual, its interim dividend for the current year. The rate is unchanged at 600 Belgian Francs per share free of tax. The date of payment has yet to be decided. This announcement is further evidence of the extent to which Union Minière's operations have remained unaffected by disturbances in the Congo from which the southern portion of the Katanga Province has so far remained relatively immune.

UNITED TIN AREAS OF NIGERIA

The annual general meeting of United Tin Areas of Nigeria, Ltd., was held on December 14 at The Chartered Insurance Institute, London, E.C.

Mr. C. S. Goddard, F.C.A., a director of the company, presided. The following is an extract from the statement of the chairman, Mr. H. Hedley Williams, M.I.M.M., circulated with the Report and Accounts for the year ended March, 31, 1960 :—

The accounts now presented represent a full year's operations on the combined properties of both this Company and Ribon Valley (Nigeria) Tinfields Limited (in liquidation) since the amalgamation proposals approved on September 24, 1959, were retrospective to April 1, 1959, the commencement of our financial year. It will be recalled that whereas in the previous year this Company's and the Ribon Valley Company's operations resulted in a net combined loss of £9,485, a profit has now been earned of £10,257. In the circumstances a dividend of 7½% is now recommended.

Reference has in the past been made to the extensive mineralization of the Odegi Areas, the full possibilities of which have not as yet been tested. Earlier this year, the Directors considered that the improved outlook for the tin industry justified a thorough geological examination of the areas with a view to evaluating their future potential and on which it would be practicable to base future mining policy to the greatest economic advantage. Accordingly a qualified and experienced geologist has been at work in Nigeria since January, 1960. On his advice certain adjacent areas have been pegged. A thorough programme of prospecting, followed by pitting and drilling where indicated, has been in progress. Whilst every step will be taken to expedite the working of any favourable sections disclosed, with a view to increasing production, it must be pointed out that adequate investigation of the future possibilities of Odegi will probably take a year or more.

The report and accounts were adopted and the dividend was approved.

NATIONAL MINING CORPORATION

MR. C. J. BURNS'S STATEMENT

The annual general meeting of The National Mining Corporation Limited, was held on December 9, at The Chartered Insurance Institute, London, E.C.2.

Mr. C. J. Burns, Chairman, presided, and the following is an extract from his Statement circulated with the report and accounts for the year ended March 31, 1960 :—

The accounts for the year under review in their consolidated form reflect for the first time the trading profits of British Patent Glazing Co. Ltd. The overall position as set out in the Profit and Loss Account is a satisfactory one and it is significant to note that, apart from the profit from the Glazing Company, both "Dividends and Interest" and "Profit on Sale of Investments" show appreciable increases.

Revenue increased from £38,632 for 1959 to £79,960 and profits after taxation from £31,732 to £61,978. Quoted Investments at a book cost of £210,744 at the date of the Balance Sheet had a market value of £264,843. Unquoted Investments show little change either in amount or prospect from last year, but it is important to realize that Revenue Reserves now amount to £143,514, and are available to cover any diminution in the value of these investments.

Dividends

In view of the enhanced position a final dividend of 2½% less income tax is now proposed, making a total distribution of 7½% less income tax for the year to March 31, 1960. The Directors have also declared an interim dividend of 5% in respect of the year ending March 31, 1961. Both dividends, aggregating 7½% less income tax, will be paid on December 9, 1960.

As previously reported to Members, the whole of the issued share capital of British Patent Glazing Co. Ltd. was acquired during the year for a consideration payable in cash over a period extending to July, 1961. This investment has proved a satisfactory purchase, as it will be noted from the Consolidated Profit and Loss Account that the contribution in profits for last year, after deducting pre-acquisition profit, was £19,894. The turnover for the current year and orders in hand are running at a higher rate than for the previous year and, in spite of the incidence of increasing costs, we look forward to a satisfactory year.

The future policy of the Corporation continues to be that of enlarging the scope of the investment portfolio and the extension of interest to other commercial spheres wherever possible and profitable.

The report and accounts were adopted.

Personal

The United Steel Companies announce that Mr. C. M. Slocombe will be appointed director of engineering of Distington Engineering Co., as from April 1, 1961, and will relinquish his present post of director of engineering at Samuel Fox and Co., on August 31, 1961.

★

Silvertown Rubber Co., announces the appointment of Mr. G. F. Copeland as Midland area manager, Belting Division.

★

Mr. V. C. Price has been appointed managing director of Sandvik Steel Band Conveyors, in succession to Mr. Ernest Bealing, who is retiring at the end of 1960, but will, however, remain on the board.

★

Following the recent retirement of Mr. A. V. Hichisson, Mr. J. Hounsell, assistant publicity manager, has been appointed publicity manager of Westinghouse Brake and Signal Co. Mr. A. A. Rhodes has been appointed deputy publicity manager.

★

The North British Rubber Co., announce that Mr. V. M. Wallis has been appointed general sales manager, Industrial Products Division. Mr. T. H. Lee is to be sales manager, hose and general products.

FREE STATE DEVELOPMENT AND INVESTMENT CORPORATION LIMITED

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, Mr. D. A. B. WATSON, *issued to Members prior to the Annual General Meeting to be held in Johannesburg on December 15, 1960.*

The directors' report and accounts deal fully with the affairs of the company for the year ended June 30, 1960. This statement comprises some additional comments on matters of particular interest.

Prospecting Operations

BY THE COMPANY

The company's own prospecting operations have been confined to drilling boreholes G.Z.1 and D.C.1 which are situated on the farms Grootvadersbosch 470 and Doornkom Oost 447, south of the Vaal River.

Details of the values obtained in borehole G.Z.1 are given in the directors' report and were also published in the press.

Since the close of the year the deflection which was being carried out in borehole D.C.1 was completed. It failed to intersect the Vaal Reef, which was faulted out, the hole passing into footwall measures at a depth of 8,003 feet. It is not proposed to carry out any further deflections in this hole.

The results obtained in borehole G.Z.1, and in some of the boreholes drilled by other companies immediately to the west and north of Grootvadersbosch 470, Die Hoek 114 and Sub-division 3 and the Remaining Extent of Doornkom Oost 447, in which properties your company has an interest, suggest that a portion of them may be underlain by Vaal Reef at a depth and of a value which may in due course be of economic interest. Further exploration will, however, be necessary before it is possible to assess the extent to which these farms may be underlain by such reef. Your company proposes, therefore, initially to drill two further boreholes in this area, as follows:

(a) One of the boreholes, G.Z.2, will be situated approximately 9,000 feet south of borehole G.Z.1, on the common boundary of the farms Grootvadersbosch 470 and Zuiping 394. It will be drilled by your company on joint account with Western Holdings Limited.

(b) The other borehole, D.O.1, will be situated some 5,500 feet south of the Vaal River on the western boundary of Sub-division 3 of the farm Doornkom Oost 447. Your company will bear one-half of the cost of this hole, the remaining half being borne by parties who have an interest in the property immediately to the west of it.

The drilling of these boreholes will commence shortly.

BY OTHER PARTIES

In the directors' report reference was made to borehole V.K.4 which was being drilled under the aegis of Eastern Rand Extensions Limited on the farm Vermeulenskraal Noord 480, south-east of the farms Tarka 656 and Jurgens Hof 813, in which latter farms your company has certain comparatively minor participation rights. Since the issue of the directors' report it has been announced that this borehole entered footwall quartzites at a depth of 7,536 feet. The Basal Reef was absent. The "B" Reef was intersected at a depth of 7,518 feet, averaging 10.1 dwts. over a corrected width of 74.1 inches, equivalent to 748 inch-pennyweights. The borehole was stopped at a depth of 8,158 feet. The official announcement by Eastern Rand Extension Limited stated that in view of the disappointing results obtained from the Basal Reef Horizon in the eight boreholes drilled on and adjacent to Vermeulenskraal Noord 480 and the adjoining farm Video 305, no further drilling was contemplated.

Participations in Prospecting Ventures

During the year under review the company acquired a participation in a prospect, known as the Western Areas No. 2 Prospect, which is being conducted by Johannesburg Consolidated Investment Company Limited in the vicinity of the Western Areas gold mine. The company's participation in the Western Areas No. 2 Prospect is along the same lines as the participation it held in the original Western Areas Prospect, i.e. the company is contributing 20 per cent of the cost of the prospect and will be entitled to 20 per cent of the *net* rights which may flow from it, after allowing for prior rights of subscription and for rights which may become due to parties from whom mineral or other rights may be acquired on behalf of the prospect.

Since the close of the year the company has also acquired a participation in three other prospects which are being conducted by Johannesburg Consolidated Investment Company Limited, one to the north of the new goldfield in the Leslie-Kinross area, one near the Klerksdorp goldfields and one in the Kroonstad area. In terms of the arrangements relating to the company's participation in these prospects, it will contribute approximately 12 per cent of their cost and will be entitled to approximately 12 per cent of the *net* rights which may flow from them, again after allowing for prior rights of subscription and for rights which may become due to other parties.

Share Investments

The company's major share investments remain its holdings in Freddies Consolidated Mines Limited and Western Areas Gold Mining Company Limited.

The holding in Freddies Consolidated Mines Limited is unchanged at 775,460 fully-paid shares.

On December 1, 1960, your company met a call of 7s. 6d. per share on one-half of its holding of 242,328 partly-paid shares in Western Areas Gold Mining Company Limited and its holding in that company now comprises 558,164 units of stock and 121,164 partly-paid shares (2s. 6d. paid).

I have nothing to add to the information already given regarding Freddies Consolidated Mines Limited in the directors' report.

As far as Western Areas is concerned, the progress in establishing the mine has been gratifying. The ventilation shaft has been completed to its final depth of 3,616 feet. It has been equipped for hoisting during the development period and development from this shaft commenced in October 1960. The sinking of the main shaft continues satisfactorily. The values obtained in the intersection of the Elsburg Reefs in both shafts were encouraging. Overall progress at the mine is ahead of schedule, and, unless there are unforeseen difficulties, there seems little doubt that production will commence before June 1963, the date anticipated by Western Areas in the prospectus issued by that company at the time of its flotation.

Finance

The sums to be expended by your company in meeting the remaining call of £45,437 on its holding of Western Areas partly-paid shares and in meeting the cost of its own drilling operations and its participations in the various prospects I have mentioned, will exceed its cash resources, which at date amount to approximately £17,000. The additional funds required will be provided in the first instance by means of short-term loans.

Conclusion

In concluding, I would like to place on record the board's appreciation of the excellent services rendered during the year by the technical and administrative staffs at head office.

December 13, 1960.

FEDERAL GOVERNMENT OF NIGERIA

PETROLEUM ENGINEERS

The Mines Division of the Federal Ministry of Mines and Power require Petroleum Engineers for Inspection of oilwell drilling and production activities, enforcement of observance of Safety Regulations of the Mineral Ordinance in so far as they apply to oilfield practices, checking of oil and gas measurements both in the field and at the export point, maintenance of accurate records of the results of drilling and production and the analysis of oil reservoir performance.

Candidates must hold a degree in Petroleum Technology or a degree in Physics, Engineering, Mining or Mathematics followed by a post-graduate course of at least one year in Petroleum Technology. A minimum of two years' practical experience as a Petroleum Engineer is necessary. Candidate should not be over 45 years of age.

Contract appointment for one tour of 15-18 months in the first instance. A fixed salary not exceeding £2,000 per annum depending on age and experience plus gratuity of £150 on satisfactory completion of service. Outfit allowance of £60 on salaries not exceeding £1,740. Free passages for officer and wife. Liberal home leave on full pay. Quarters and income tax at low local rates. Children's allowances while separated.

Write for application forms and further particulars, stating briefly age, qualifications and experience, to the Appointments Secretary, Federal Public Service Commission, Nigeria House, 9 Northumberland Avenue, London, W.C.2, quoting Q.5/5.

LAKE VIEW AND STAR

SIR JOSEPH BALL'S SPEECH

The Fiftieth Annual General Meeting of Lake View and Star Limited was held on December 8, 1960, in London.

Sir Joseph Ball, K.B.E. (the Chairman), in the course of his speech, said:—

The overall increase in gold production for the year ended June 30, 1960, which rose by 1,491 ounces, resulted in an increase in revenue of £19,550 over the figure for the previous year. At the same time total mine expenditure increased by £23,924, although by reason of the higher tonnage milled, the unit cost of production fell by 2d. per ton. The net result, however, was an overall decrease in the mining profit of £3,756.

The Company has maintained its qualification as an Overseas Trade Corporation and is assessed for tax purposes on this basis. We are, therefore, authorized to pay dividends to non-resident Shareholders without deduction of United Kingdom income tax from that part of the dividends deemed to be paid out of exempt trading income.

An interim dividend of 1/- per share was paid during the year, absorbing a net amount of £85,750, and a final dividend of 1/6d. per share is recommended. The unappropriated mining profit carried forward amounts to £77,986 as compared with £75,905 brought forward from last year.

The adoption of electric hoisting has resulted in a reduction in costs amounting to 2s. 3d. per ton milled.

It now falls to me to say something to you about the future of the Company, and I am afraid that some of what I have to say must necessarily be of a somewhat serious nature.

I would state at the outset that we are quite happy with the staff situation, under our new Manager, Mr. R. C. Buckett, and his assistants; but I am very much afraid that the handicaps to which I propose to refer are beyond the control, either of the Management in Australia, or of the Board of Directors in London.

Running throughout the whole of the company's history has been the constant bugbear of rising costs, accentuated as it has been especially during recent years by Australian legislation with regard to what is known as the "Basic Wage".

Legislation applying to the whole of Australia imposes a basic wage linked with the cost of living subject to quarterly reviews by Arbitration Courts.

This policy bears particularly hardly upon the gold mining industry, which receives a fixed price for its product.

Between February, 1949, and October, 1960, the basic wage has increased from £6 12s. 9d. per week to £14 7s. 1d. per week.

In addition there were increases in 1955 in the extra rates paid to skilled and semi-skilled operators which resulted in an additional cost to the Company of £A25,000 per annum, and another increase in May, 1960, which will cost the Company a further £A34,000 per annum.

We have during the past four years, largely by means of capital expenditure, managed to keep rising costs at bay, but we now appear to be reaching the end of our tether in this respect; and in the absence of some change of policy with regard to the basic wage, or alternatively some carefully devised revision of the Gold Mining Industry Assistance Act of 1954, it would appear that we must look forward to a period of declining profits and dividends.

But this is by no means the worst feature of the situation. Progressive rises in costs necessarily result in progressive elimination of the lower grade blocks from the ore reserve. For example, as a result of the increase of 4s. 5d. per ton during the year ended June 30, 1951, it was necessary to eliminate from the reserve some 111,900 tons of low grade ore; and in the following year when costs rose a further 5s. 9d. per ton, 342,000 more tons had to be written off.

If this elimination of low grade blocks were to be continued too far, the position could be reached when there were too few faces available for stoping to allow of the mill being operated at its full capacity, and this in turn would result in a higher cost per ton milled.

Our profit today is only some 10/- sterling per ton and if we are in the future to be faced with quarterly rises in the basic wage on the scale which we have experienced in the past 10 or 11 years, this margin would be progressively reduced.

Shareholders may well ask what is the remedy? The answer is that this lies in the hands of the Australian Governments, both Federal and State; and must therefore necessarily remain a matter for their decision. We can only suggest possible remedies and this we are proposing to do without delay; in fact, unofficial discussions have already taken place with the Hon. E. K. Hoar, the senior Western Australian Government representative here, and we have undertaken to submit a memorandum on the subject in the near future.

The Report and Accounts were adopted.

MAP OF THE GOLD MINES OF THE KINROSS AREA

Copies of this map, prepared by *The Technical Map Service* of Johannesburg, are now available in London. They show (as at November 1959):-

- the exact position of each mine on the field.
- where on each property boreholes have been sunk, and what has been the core recovery on reef intersection.
- what shafts are being sunk.

Accompanying this map is a small outline map, bringing the borehole results up-to-date as at October 1960.

★While a mine is at the development stage, it is of vital importance to have a visual picture of its position in relation to the field as a whole. Otherwise the quarterly results published by the companies lose much of their significance.

★Results reported from adjacent mines often have a direct bearing on the one in which you are interested, which, however, can only become apparent if you have clearly in mind the position of the properties in relation to one another.

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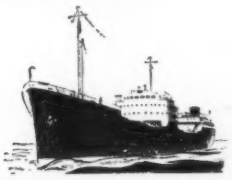

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